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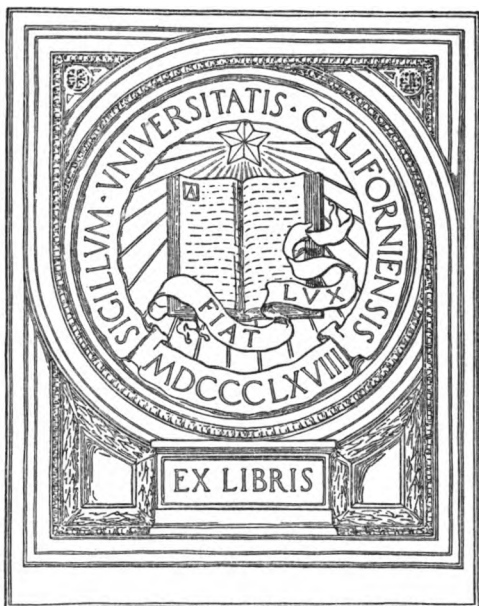
ANNUAL REPORT  
OF THE  
NEBRASKA  
STATE HORTICULTURAL SOCIETY.  

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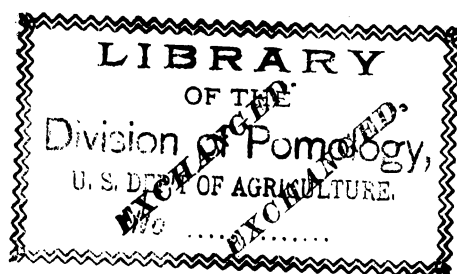
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*By R. N. DAY, Secretary.*



COLLEGE OF AGRICULTURE  
DAVIS, CALIFORNIA









# ANNUAL REPORT

OF THE

NEBRASKA <sup>INDEXED.</sup>

## STATE HORTICULTURAL SOCIETY,

*FOR THE YEAR 1892.*

CONTAINING THE PROCEEDINGS OF THE SEMI-ANNUAL AND ANNUAL  
MEETINGS HELD IN AUGUST, 1891, AND JANUARY, 1892.

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EDITED BY THE SECRETARY. PUBLISHED BY THE STATE.

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LINCOLN, NEB.:

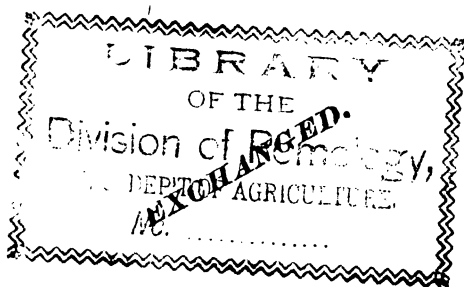
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## LETTER OF TRANSMITTAL.

OFFICE OF THE SECRETARY,  
NEBRASKA STATE HORTICULTURAL SOCIETY,  
TEKAMAH, NEB., January, 1892.

*To His Excellency, James E. Boyd, Governor of the State of Nebraska:*

In compliance with the statutes of the state of Nebraska, relating to the establishment of the Nebraska State Horticultural Society, as made and provided therein, I take pleasure in submitting for your inspection and consideration a copy of the Annual Report for the year 1892, trusting it will receive at your hands such careful attention and consideration and criticisms as your excellency may deem proper.

The past year, and in fact the past three years have been so fruitful in Nebraska that the Nebraska State Horticultural Society deem it not only prudent but very desirable and essential that the interests of the fruit grower in Nebraska should be fostered and encouraged to its utmost extent by a sufficient appropriation, in addition to what they now have, to carry on a system of experimentation in at least twelve or fifteen different locations in the state.

I would further call your attention to the necessity of a proper display of our horticultural products at the coming World's Fair, to be held at Chicago in 1893, and hope we may be favorably considered in so far as your influence in the exalted position to which you have been called by the people of our beloved state to occupy, may add to our success.

Asking a careful perusal of the contents of this volume at your hands, I remain

Your obedient servant,

R. N. DAY, *Secretary.*



## OFFICERS AND STANDING COMMITTEES, 1892.

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### OFFICERS.

E. F. Stephens, President.....	Crete
D. U. Reed, First Vice President.....	Blue Springs
O. F. Smith, Second Vice President.....	Ansley
F. W. Taylor, Secretary.....	Lincoln
Peter Youngers, Jr., Treasurer.....	Geneva

### DIRECTORS.

D. C. Mosier.....	Lincoln
W. J. Hesser.....	Plattsmouth
J. M. Russell.....	Wymore

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## STANDING COMMITTEES.

---

### SYNONYMS.

J. H. Masters.....	Nebraska City
--------------------	---------------

### METEOROLOGY.

Prof. G. D. Swezey.....	Crete
-------------------------	-------

### ENTOMOLOGY.

Prof. Lawrence Bruner.....	Lincoln
----------------------------	---------

### ORNITHOLOGY.

G. A. Coleman.....	Lincoln
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### GEOLOGY.

Prof. L. E. Hicks.....	Lincoln
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## FORESTRY.

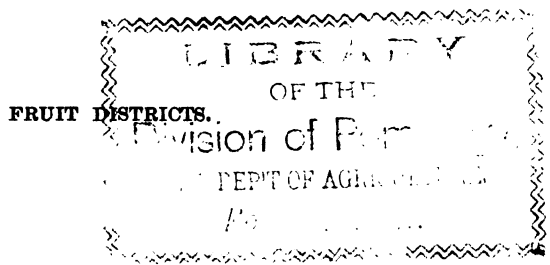
G. A. Marshall.....Arlington

## VEGETABLE CULTURE.

A. Gaiser.....Tecumseh

## ORNAMENTAL GARDENING.

J. H. Hadkinson.....Lincoln



## FRUIT DISTRICTS.

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### No. 1—SOUTHEASTERN.

Director, D. U. Reed, Blue Springs, Nebraska. Embraces the following counties: Polk, Butler, Saunders, Cass, Lancaster, Seward, York, Clay, Hamilton, Fillmore, Saline, Otoe, Johnson, Nemaha, Richardson, Pawnee, Gage, Jefferson, Thayer, and Nuckolls.

### No. 2—NORTHEASTERN.

Director, C. W. Gurney, Concord, Nebraska. Embraces the following counties: Knox, Dixon, Dakota, Cedar, Wayne, Pierce, Holt, Antelope, Madison, Stanton, Cuming, Burt, Platte, Colfax, Dodge, Washington, Douglas, Sarpy, and Thurston.

### No. 3—EAST-CENTRAL.

Director, W. F. Jenkins, Arcadia, Nebraska. Embraces the following counties: Wheeler, Garfield, Loup, east half of Custer, Valley, Greeley, Boone, Nance, Merrick, Howard, Sherman, Buffalo, and Hall.

### No. 4—WEST-CENTRAL.

Director, E. Schroeder, Logan, Nebraska. Embraces the following counties: Blaine, Thomas, Hooker, Grant, Arthur, McPherson, Logan, west half of Custer, Dawson, Lincoln, and Keith.

### No. 5—LOWER REPUBLICAN.

Director, G. A. Strand, Minden, Nebraska. Embraces the following counties: Adams, Kearney, Phelps, Gosper, Frontier, Red Willow, Furnas, Harlan, Franklin, and Webster.

### No. 6—SOUTHWESTERN.

Director, John H. Powers, Trenton, Nebraska. Embraces the following counties: Perkins, Chase, Hayes, Hitchcock, and Dundy.

**No. 7—LOWER NIOBRARA.**

Director, Mr. Beebe, Long Pine, Nebraska. Embraces the following counties: Holt, Keya Paha, Rock, Brown, and Cherry.

**No. 8—NORTHWESTERN.**

Director, J. J. Adams, Crawford, Nebraska. Embraces the following counties: Sheridan, Dawes, Box Butte, and Sioux.

**No. 9—WESTERN.**

No director appointed. Embraces the following counties: Scott's Bluff, Banner, and Kimball.

## MEMBERS OF THE SOCIETY.

## LIFE MEMBERS.

Barnard, C. H.....	Table Rock
Brown, J. L.....	Kearney
Bessey, Chas. E.....	Lincoln
Bowers, W. B.....	513 North Ninth street, Omaha
Brown, A. J.....	Geneva
Beaver, Elias.....	Falls City
Chowins, Charles E.....	Lincoln
Crist, J. W.....	Box 761, Lincoln
Carpenter, G. J.....	Fairbury
Craig, Hiram.....	Fort Calhoun
Day, R. N.....	Tekamah
De France, C. Q.....	Fairbury
Deweber, H. N.....	Pawnee City
Davey, R. H.....	Omaha
Dunlap, J. P.....	Dwight
Erfing, E. C.....	1150 Sherman avenue, Omaha
Fredenberg, B.....	Johnson
Furnas, R. W.....	Brownville
Gage, J. A.....	Fairbury
Galbraith, G. B.....	Jansen
Grennell, E. N.....	Fort Calhoun
Harris, W. R.....	Tecumseh
Hartley, E. T.....	Lincoln
Hogg, J. A.....	Shelton
Hesser, W. J.....	Plattsmouth
Hartman, Chris.....	206 Shelby block, Omaha
Jenkins, W. F.....	Arcadia
Langdon, J. M.....	Seward
Marshall, G. A.....	Arlington
Masters, J. H.....	Nebraska City
Masters, J. W.....	Lincoln
Mosier, D. C.....	Lincoln



Murphy, P. A.....	Exeter
Neff, J. G.....	Raymond
Reed, D. U.....	Blue Springs
Sanborn, E. E.....	Springfield
Slayton, Geo. A.....	Salem
Stephens, E. F.....	Crete
Smith, H. L.....	Geneva
Taylor, F. W.....	Lincoln
Wilson, W. H.....	Lincoln
Wheeler, D. H.....	Omaha
Warren, G. F.....	Harvard
Youngers, Jr., Peter.....	Geneva

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### HONORARY MEMBERS.

Budd, J. L.....	Ames, Iowa
Brackett, G. B.....	Denmark, Iowa
Campbell, Geo.....	Delaware, Ohio
Chase County Agricultural and Horticultural Society,	
	Champion, Nebraska
Coleman, A. F.....	Corning, Iowa
Earle, Parker.....	Cobden, Illinois
Garfield, C. W.....	Grand Rapids, Michigan
Gideon, P. M.....	Excelsior, Minnesota
Lyon, T. T.....	South Haven, Michigan
Narlatte, W.....	Manhattan, Kansas
Peffer, G. P.....	Pewaukee, Wisconsin
Tracy, S. M.....	Columbia, Missouri
Van Deman, K.....	Geneva, Kansas
Williams, L. A.....	Glenwood, Iowa

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### ANNUAL MEMBERS.

#### SUMMER MEETING AT HASTINGS.

Brown, J. L.....	Kearney
Coulter, J. W.....	Hastings
Harrison, C. S.....	Franklin
Hartwell, James B.....	Hastings
Henthorn, I.....	Kearney

Marshall, W. D.....	Waverly
Page, I. H.....	Byron
Philleo, W. W.....	Ayr
Rittenhouse, C. C.....	Hastings
Rich, O. W.....	Atlantic, Iowa
Stearn, M.....	Hastings
Shockey, R. V.....	Hastings
Wolverton, E. K.....	Carnes, Kansas

## WINTER MEETING AT LINCOLN.

Alexander, G. W.....	Friend
Barber, Harry .....	Lincoln
Buckner, Charles .....	Portal
Brown, J. L.....	Kearney
Bross, H.....	Lincoln
Blodgett, H. H.....	Lincoln
Bauer, John .....	Alcove
Bridges, J. J.....	Lincoln
Baldwin, Mark .....	Stanton
Bauer, Leonard.....	Lincoln
Barker, Tom.....	Eagle
Borschell, John.....	Lincoln
Beltzer, L. A.....	Osceola
Barber, J. M.....	Lincoln
Cherry, C. M.....	Weeping Water
Chamberlain, C. W.....	Lincoln
Crawford, D. C.....	Lincoln
Campbell, J. T.....	Litchfield
Coulter, J. W.....	Hastings
Crayon, John .....	Tekamah
Chapin, L. C.....	Lincoln
Coulter, Wilber .....	Redington
Crist, J. W.....	Lincoln
Colvin, W. E.....	Crete
Connell, N. G.....	Lincoln
Coleman, G. A.....	Lincoln
Dugan, John.....	Portal
Day, R. N.....	Tekamah
Duncan, D. M.....	Fairbury

Damrow, C. F.....	Lincoln
Duncanson, H. B.....	Lincoln
Eastman, W. S.....	Lincoln
Fleming, J. E.....	Weeping Water
Fox, B. C.....	Eagle
Goodrich, V. W.....	Lincoln
Gurney, C. W.....	Concord
Gillilan, J. A.....	Lincoln
Gaiser, A.....	Tecumseh
Galbraith, G. B.....	Jansen
Harris, W. T.....	Summerford
Hadkinson, J. H.....	Lincoln
Hyatt, A. J.....	Lincoln
Haydon, C. G.....	Lincoln
Hoppe, E.....	Lincoln
Hooker, M. R.....	Lincoln
Hullhorst, Miss Nellie.....	Fairbury
Jones, Miss E.....	Fairbury
Johnson, W. J.....	Lincoln
Jenkins, W. F.....	Arcadia
Kemp, E. E.....	Lincoln
Kilpatrick, J. F.....	Lincoln
Kreamer, John.....	Talmage
Kimball, Geo. W.....	Hastings
Langhry, J. F.....	Geneva
Little, R. H.....	Lincoln
Loomis, C. E.....	Lincoln
Laing, C. G.....	Springfield
Leigh, E. C.....	Beatrice
Lewis, S. S.....	Fairbury
Love, J. H.....	Tekamah
Lyon, J. H.....	Lyons
Marshall, W. D.....	Waverly
McCann, J. R.....	De Witt
Manley, E. K.....	Lincoln
Marshall, E. W.....	Arlington
Moser, August.....	Lincoln
Morse, W. H.....	Florence

Neff, J. G.....	Richmond
Newberry, Horace J.....	Omaha
Paxton, J. C.....	Richfield
Preston, P.....	Exeter
Price, J. H.....	Clay Center
Portchy, Matt.....	Lincoln
Portchy, Paul.....	Crete
Pearce, James.....	2945 Dudley street, Lincoln
Russell, J. M.....	Wymore
Roberts, B. A.....	Albion
Richmond, W. A.....	Lincoln
Rumhold, Nels.....	Lincoln
Riley, Alfred.....	Crete
Smith, E. A.....	Lincoln
Stevenson, J. W.....	North Bend
Smith, O. F.....	Ansley
Strand, G. A.....	Minden
Seymour, A. P.....	Unadilla
Slayton, Geo. A.....	Salem
Shue, E. J.....	Lincoln
Sage, A. D.....	Beatrice
Smith, A. R.....	Saltillo
Sargent, Thos. B.....	Lincoln
Troyer, A. M. ....	Lincoln
Thomas, E. A.....	Lincoln
Woods, A. F.....	State University
White, John .....	Lincoln
Williams, W. A.....	Lincoln
Witter, Miss M. W.....	Lincoln
Wilson, Albert.....	Eldorado
Warner, G. W.....	Syracuse
Young, N. M.....	Reynolds
Yeomans, B. C.....	Weeping Water
Young, A. E.....	Lincoln

CONSTITUTION.

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ARTICLE I.—*Name*.—This association shall be known as the Nebraska State Horticultural Society.

ARTICLE II.—*Object*.—This Society shall have for its object the promotion of Pomology, Arboriculture, Floriculture, and Gradenig.

ARTICLE III.—*Membership*.—The membership of this Society shall consist of three classes, viz., active, associate, and honorary. The active membership shall consist of persons practically engaged in fruit culture, forestry, floriculture, or gardening, who shall be admitted to active membership on the payment of a fee of \$5 at one time; to associate membership, by the payment of a fee of \$1 annually. The honorary members shall consist of such persons as may be elected at any meeting of the Society by a two-thirds vote of the members present, and shall have all the privileges and benefits of the Society except that of voting and holding office, which privileges shall belong exclusively to active members.

ARTICLE IV.—*Officers*.—The officers of this Society shall be a President, First and Second Vice Presidents, Secretary, Treasurer, and a Board of Directors of eight members, said board consisting of the officers enumerated in this article and three additional members. These officers shall be elected by ballot at the Annual Meeting of the Society in January, and the term of office shall be for one year, or until their successors are elected and qualified.

ARTICLE V.—*Duties of President*.—It shall be the duty of the President to preside at all meetings of the Society, appoint all committees not otherwise provided for, countersign all orders drawn on the Treasurer by the Secretary, in conjunction with the Secretary shall arrange all programmes for the meetings of the Society, and perform such other duties as the Society or Board of Directors may require. He shall enter upon his duties on the adjournment of the Annual Meeting in January.

ARTICLE VI.—*Duties of Vice Presidents*.—The Vice Presidents shall superintend all exhibits of the Society, and in case of vacancy in

the office of President at any meeting of the Society or Board of Directors, shall perform all the functions of that office in the order of their rank.

ARTICLE VII.—*Duties of Secretary.*—The Secretary shall keep an accurate record of the proceedings of all meetings of the Society and Board of Directors, draw all warrants on the Treasurer, and keep an accurate record of the same as countersigned by the President, prepare for publication and edit all reports of the Society requiring publication by the statutes of the state, in conjunction with the President prepare all programmes and make all other necessary arrangements for all meetings of the Society. He shall enter upon his duties on June 1st of each year after his election.

ARTICLE VIII.—*Duties of Treasurer.*—The Treasurer shall be the custodian of all moneys belonging to the Society, and shall pay from such funds all warrants drawn on him by the Secretary and countersigned by the President. He shall enter upon his duties immediately upon his election.

ARTICLE IX.—*Duties of Board of Directors.*—The Board of Directors shall have general management of all the affairs of the Society, for which no specific directions are otherwise provided in the Constitution and By-Laws.

ARTICLE X.—*Bonds of Officers.*—The President, Secretary, and Treasurer shall each give a bond in the sum of \$5,000 for the proper performance of his duties, which bond must be approved by the Board of Directors.

ARTICLE XI.—*Salaries of Officers.*—The President, Vice Presidents, Treasurer, and members of the Board of Directors shall receive such per diem pay for their services in attendance upon the meetings of the Society as the Society or Board of Directors may from time to time determine. The Secretary shall receive an annual salary of \$500.

ARTICLE XII.—*Reports of Officers.*—The President, Secretary, and Treasurer shall each present an annual report in writing at the January meeting of all the business matters pertaining to their respective offices during the annual term expiring at that time.

ARTICLE XIII.—*Meetings.*—The Society shall hold two or more meetings each year. The Annual Meeting shall be held at Lincoln in January, commencing on the Tuesday after the second Sunday, as provided by statute, and the other meeting shall be held at the same time

and place as the annual exhibition of the Nebraska State Board of Agriculture.

ARTICLE XIV.—*By-Laws*.—By-Laws not in conflict with the provisions of this Constitution may be enacted by the Society at any regular meeting.

ARTICLE XV.—*Amendments*.—This Constitution may be amended at January meetings of the Society by a two-thirds vote of the members present, such amendment having been presented in writing and read before the Society at a session preceding the one in which the vote is taken.

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### BY-LAWS.

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1. All the officers of this Society shall be elected at the January meeting.

2. All officers of this Society, except the Secretary, shall hold their respective offices until their successors are elected and qualified, or till close of winter meeting. The Treasurer, however, shall enter immediately upon the duties of his office.

3. The Secretary elected at the January meeting, 1891, shall hold his office until the first day of June, 1892.

4. Each Secretary, after the one named in By-Law 3, shall be elected at the January meeting of each year and take his office on the first day of June following.

5. The first business of the Society shall be on each morning the reading of the minutes of the previous day's proceedings, and submitting the same to the approval of the meeting.

6. There shall be elected at each winter meeting nine District Directors, one from each horticultural district in the state.

Also a standing committee of three on Synonyms.

Also a standing committee of one in each of the following: Meteorology in its relation to Horticulture, Entomology, Ornithology, Geology, Forestry, Vegetable Culture, and Ornamental Gardening.

7. These By-Laws may be amended at any general meeting of the Society by a majority of the members present.

## REGULATIONS.

1. All entries for exhibition at the State Fair shall be made on or before six o'clock P. M. of Monday the opening day of the fair to the public.

2. All fruit and flowers (except cut flowers) not in place Monday night of fair week shall be debarred from competition.

Fruits must be grown in the state, and by the exhibitor, and be correctly named and labeled.

Fruits and flowers competing for same premiums must be arranged, as near as may be, together.

"Collections" of fruit must embrace at least five different varieties, and not less than five specimens of each variety, and arranged in a body or group.

The "Collection of Fruits," Lot 1, shall be separate and distinct from minor exhibits, but must be exhibited by the party growing, or in the name of the county in which grown, or in the name of the county horticultural or pomological society of the county in which grown.

"Seedlings" must be characterized for excellence equal at least with those of established varieties of same grade and season before being entitled to recognition by the Society.

Articles on exhibition or occupying space in hall cannot be removed during Fair except by special permit of the President. This rule is intended to prevent mere sale stands in hall, or of articles on exhibition.

All fruits obtaining premiums become the property of the Society, to be sent elsewhere for exhibition, as the Board of Directors may determine.

All fruits or other articles in competition for the same premium must be arranged together in groups. This cannot be varied from. When not otherwise specified, there must be five perfect specimens of fruit on each plate, no more and no less. No duplicates of any kind will be tolerated.

When there is but one exhibitor competing for premium, commit-



tees may, at their option, award no premium, second, or first, as merit may warrant.

*If any person shall exhibit for competition any fruits, flowers, or other articles not of his or her own production, as required by the regulations, said exhibitor shall forfeit any premium awarded and be debarred from competing for the term of five years.*

All exhibits must remain on exhibition until 4:30 o'clock P. M., on the last day of the Fair, or premiums are forfeited.

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## RULES FOR JUDGING FRUITS, WITH A SCALE OF POINTS.

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### GENERAL RULES.

1st. In all cases the judges are to be governed by the letter and spirit of the schedule under which exhibitors have made their entries, the general appearance of the fruit, care in its selection, and taste displayed in its arrangement or grouping, each entry being distinctly separated from the rest. These are all elements of the highest importance, and should receive appropriate consideration by the committee.

2d. In every group, whether the single plates, the threes, fives, tens, or larger collections of fruits, there should never be more than one plate of any variety in any one group. Lists of names of varieties exhibited shall accompany each group, and must be attached to the entry card, and have a corresponding number and designation—with or without exhibitor's name—according to rule.

3d. The *same plates* of fruit *cannot* compete for different prizes, though the several entries for the best ten, five, or other numbers, and the best plate, may embrace the same varieties, but not the same plates of specimens; in each case they must be duplicates, and in sweepstakes they will count for a single variety.

4th. When the schedule prescribes the number of each kind, usually three or five, to be placed on exhibition, not less than the exact number must be presented.

5th. In general collections of fruits by individuals, counties, or otherwise, when the several species of fruits are specified in the schedule, they must all be presented, or the collection may be passed by the committee.

6th. In all cases, but more especially in the display, or greatest and best collections, *number* of varieties is the *prima facie* test of superiority, other things being equal; but quality, relative value, their perfect condition, and tasteful appearance, will be considered, and should rank thus, respectively: 1. Number. 2. Quality or value. 3. Condition, approaching perfection. 4. Taste in the display.

7. Unless there are special rules to the contrary, the general rules that govern the exhibition of fruit shall apply to the exhibition of flowers. For collections, viz., of roses, palms, etc., not more than three of any one variety will be allowed in any one collection. In judging collections, two plants of different varieties shall rank equal to three of one variety. To illustrate. On a scale of ten—

No. 1 may have 100 plates, the largest collection.....	10
Quality: Some inferior varieties.....	5
Condition of fruit: Rather poor.....	5
Taste in display.....	5
Total.....	25

No. 2 may have 90 plates, ranking.....	8
Quality: Superior in most, ranking.....	8
Condition of fruit: Perfect, ranking.....	10
Taste in the arrangement: Good, ranking.....	—
	8
Total.....	35

No. 2 would, in this case, take the premium.

In the case of single plates of the several kinds named, or in a competition for the best plate or basket of any kind of fruit, we may consider condition, form, size, color, and texture, with flavor. On the same scale we may have two entries to decide, thus:

No. 1.

Condition: Perfect.....	10
Form: Abnormal.....	8
Size: Overgrown.....	8
Color: Perfect.....	10
Texture and Flavor: Superior.....	10
Total.....	46

## No. 2.

Condition: Stem lost.....	8
Form: Perfect .....	10
Size: Uneven. ....	6
Color: Too pale.....	6
Texture and Flavor: Insipid.....	5
Total.....	35

This scaling might be used in deciding between any number of single plates of designated varieties competing with one another for the best plate of any kind, or for the basket premium with assortment of single variety, according to the words of the schedule.

## SPECIAL RULES.

The judges shall have an ideal standard of perfection in all cases, made up of the following particulars:

1st. The *condition* and general appearance of the fruit, which must be in its natural state, not rubbed or polished, nor specked, bruised, wormy, nor eroded; with all its parts, stem, and calyx-segments well preserved, not wilted nor shriveled, clean.

2d. The *size*, in apples and pears particularly, should be average, and neither overgrown nor small. The specimens should be even in size.

3d. The *form* should be regular, or normal to the variety, and the lot even.

4th. The *color* and *markings*, or the *surface*, to be in character not blotched nor scabby.

5th. When comparing different varieties, and even the same kind grown on different soils, the *texture* and *flavor* are important elements in coming to a decision. 5 points.

In the class PEACHES, PLUMS, etc., the important elements are *size*, *form*, *color*, *flavor*, and *condition*. 5 points.

In GRAPES we must consider and compare the *form* and *size* of the *bunches*, the *size* of the *berries*, their *color*, *ripeness*, and *flavor*, and *condition*. 5 points.

In CURRANTS we shall have to examine the *perfection* and *size* of the *bunches*, and of the *berries*, their *flavor* and *condition*. 3 points.

In GOOSEBERRIES we shall look at the *size*, *color*, *flavor*, and *condition*. 4 points.

In judging **CHERRIES** we have as our guide the *size* and *form*, *color*, *flavor*, and *condition*. 4 points.

In judging **STRAWBERRIES** we shall compare the *size* and *form*, *color*, *flavor*, *firmness*, and *condition*. 5 points.

They should be shown with stem and calyx.

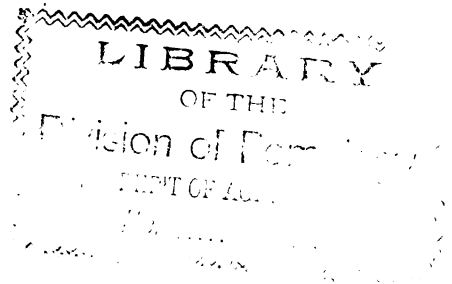
**RASPBERRIES** may be shown with or without the calyx. In this fruit we shall have to judge of the *size*, *color*, *flavor*, and *condition*. 4 points.

**BLACKCAPS** must have *size*, *color*, *flavor*, and *condition*. 4 points.

**BLACKBERRIES** must be tested according as they present *size*, *color* and *form*, *flavor* and *texture*, and *condition*. 4 points.

In all cases it is well to have a convenient scale of comparison, for which the number *ten* is found to be easily managed. The highest figure denotes perfection for the variety, and five is mediocre; below that is condemnatory. The total of the marks should exceed fifty per cent of the possible number, or the entry must be passed as unworthy of reward.

Seedlings having once been presented, and failing recognition under the rules of the Society, shall not again be presented.





# PROCEEDINGS.

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## SEMI-ANNUAL MEETING.

HASTINGS, NEB., August 4, 1891, 2 P. M.

Called to order by President Taylor.

Reading of minutes dispensed with on account of their appearing in the report for 1891.

TAYLOR—I have no president's address; prefer to wait until tomorrow; have some important points in regard to the World's Fair.

## SUCCESSFUL STRAWBERRY CULTURE.

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BY J. W. STEVENSON.

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In 1882, when I first commenced to plant strawberries, I felt more competent to write on this subject than I do now. I have found experience as important as theory, though vastly more expensive. Probably "unsuccessful" strawberry culture would make a much larger chapter in my experience than the successful part. This may be truly said of nearly all engaged in the business.

The conditions for success vary much. In Nebraska, dry springs, falls, and winters must be taken into consideration; and often varieties successful in the east are a failure here. An improper selection of varieties has been my chief loss in this business. We know better now what varieties to plant, and how to guard against drouths by planting varieties that will stand drouth the best; by thorough cultivation and mulching, and sometimes irrigating, where it is convenient. Our soil, upland and valley, is excellent for strawberry culture; and with sufficient moisture, will yield abundantly. Where corn and potatoes can be grown, strawberries can be raised with equal success.

Notwithstanding, the farmer will give his corn and potatoes and garden vegetables thorough cultivation, and let the strawberry patch take care of itself.

We want to encourage every farmer to grow all the strawberries he needs. There is no reason why he should not have them—and he will not if he depends on purchasing them. They should be planted in long rows, so that a cultivator can be used, and they should be far enough from the barn that poultry and pigs will not find them. A good way for a small patch is to enclose them in a paled garden. They will not require more work than potatoes, and will yield nearly as many bushels. The garden patch can be kept renewed each year by spading into narrow strips and throwing out the old plants.

*Location.*—Strawberries should be planted on rich, well-drained land that has been cultivated and kept free from weeds the previous year. If the ground has been very foul with weeds the preceding year, much extra work will be required to keep it clean, and weed seeds will give much trouble the next year before the strawberry plants yield a crop. I have tried summer fallowing, but do not recommend it; the same labor attending it would cultivate a crop of corn or potatoes.

*Preparing the Ground.*—The ground before plowing should be abundantly manured with well-rotted manure. The depth of plowing will depend on depth of soil, and depth of previous plowing. It is not advisable to bring to the surface too much of the unstirred subsoil. If this subsoil is hard, a subsoil plow should follow, stirring the furrow four to six inches deeper than it has been plowed. A very good subsoil plow can be made from an ordinary "grasshopper" breaking plow. After plowing, the ground should be thoroughly harrowed, rolled or floated to settle the soil and pulverize all clods, and even the surface. Mark out the rows with a light marker, three and one-half feet apart, or the usual width of corn rows.

*Planting.*—The plants may be set twelve to eighteen inches apart in the row, according to variety. An ordinary spade is as good a tool as any for planting. The plants should be kept in a pail with water, and with an active boy to carry them and place the plants with the roots spread out in the hole made by the spade, a man can plant from 2,000 to 3,000 plants per day. The soil should be pressed firmly to the roots by the spade, and by tramping with the feet. A dibble

twelve inches long may be used instead of a spade. Only the best young plants should be used. It is not profitable to use old plants, even though you can move them with the soil adhering to them. This mistake is often made in taking plants from old beds belonging to our neighbors. The plants may not cost much, but the yield is in the same proportion. Get plants where you can get them young, and varieties pure; and as near home as possible. Every fourth row should be a staminate, or fertilizing sort; and the other three rows may be planted with the pistillate sorts, as they when fertilized are the most prolific. We have not as yet found a staminate sort that is satisfactory in every respect. The Captain Jack is the best all around berry I have found of the staminate sorts. Jessie and James Vick are good fertilizers, but that is about all we can say for them. A proper selection of varieties is very necessary to success. Some of the highly praised new sorts are a delusion, and some of the old standard sorts grown in the east are a failure here. He who plants largely of such sorts as Jessie, Sharpless, Bidwell, James Vick, Jumbo, Wilson, Downing, Sucker State, will come to grief. Plant largely of such sorts as Warfield No. 2, Bubach No. 5, Haverland, Crescent, Captain Jack and Mt. Vernon. Such highly recommended sorts as Mrs. Cleveland, Lady Rusk, Racster, Saunders, Great Pacific, Parker Earle, Wolverton, Stayman's No. 1, Crawford, and many others need further testing before planting them extensively. "Prove all sorts, and hold fast to all that are good."

*When to Plant.*—Spring planting may be done from April 10th to May 15th. Early planting is to be preferred if the season is not too dry. New plants can be transplanted in July, August, and September. If possible lift the soil with the plants; this can be done by pressing the soil with the hand more firmly about the roots, or by using a transplanter similar to a patent post-hole digger, and with it lift plant and earth to an adjacent row. If plants are to be moved a distance, they may be previously potted, or tin transplanting tubes may be used. The tube is about three inches in diameter, and four and one-half inches long. This is pressed into the soil around the plant, and, with aid of a trowel or dibble tube, plant and earth are lifted to a tray and moved to place wanted. By using these planting can be done in dry weather and plants are not retarded in their growth. In planting always have the crown of the plant even with the surface of the ground when set-



tled. Better cut off fruit-stems first year, as plant growth is of most importance.

*Cultivation.*—Weeds should be destroyed almost before they appear. Someone has said, "Three hoeings are more easily done than one." This is very true. Avoid cutting deeply with the hoe near the plants, particularly in the spring, as the ground is full of little rootlets. Frequent cultivation is necessary until October. Turn the runners to fill up all vacant places, and sides of the row. A little soil placed on the runners at joints will expedite the formation of plants. A space of twenty inches between rows should be kept clear of plants. If runners grow too freely they may be cut off with a sharp hoe, and in large fields some other device on a large scale may be used, such as sharp blades or rolling cutters attached to a frame, and drawn by a horse, cutting the runners on two sides at once. If plants have set too thickly, part of them should be chipped out with a sharp hoe early in the spring. With some varieties it will be profitable to cut out one-third of the plants. Inexperienced growers fail to grow the quantity and size of berries they should, because the plants are too dense. The matted row is certainly the most convenient, as well as the most profitable way to grow strawberries, if we avoid the mistake of having them too dense, particularly in dry seasons.

*Mulching.*—About December 1st the plants should be covered with coarse prairie hay—if it can be obtained—two inches deep. If the fall is very dry, the mulching may be applied as early as November 15th. Our dry falls and winters will permit an earlier and heavier covering of plants than would be safe east of us. Stable manure applied in November is very beneficial to the plants, by enriching them and serving as an aid to mulching. In the first part of April the mulching should be raked from the plants, and placed between the rows and left there until after the fruit is picked. It is better to have the mulching abundant enough to prevent all weeds from growing between the rows. If it is not heavy enough, better remove it and cultivate, and before berries are ripe, replace the mulching. Heavy mulching will save labor of cultivating. Moving it twice holds moisture and keeps the plants from blooming early, thus saving from danger of late frosts. I find a late crop more profitable because it does not come in competition with the southern crop.

*Renewing Old Beds.*—What shall we do with our fields after first

crop is picked? We would gain in yield and save labor if we had planted a new field in the spring, intending to plow under the old field. Often it is not convenient to do this and we must do the best we can with the old field. With an eight to ten inch plow and rolling cutter, plow under all the row except an eight to ten inch strip on one side of the row. Two to three furrows will be necessary for each row. It is best to leave the strip on one side of the row, as the youngest plants are thus preserved. Cultivate the ground down level, and rake soil about the plants, for new roots must grow higher up than on previous year. I have not found any difficulty with crowns of the plants rotting because of a light covering of soil. The tops may be mowed off before trimming the rows. I do not think it is a matter of much importance whether they are cut off or not.

*Insect Enemies.*—I have had expensive experience with the strawberry worm, but find a timely application of Paris green or London purple an unfailing remedy. The poison may be applied twice in the month of May. Four ounces is about enough for an acre, and there can be but little danger from its use two or three weeks before berries are picked. An application of poison in the fall, or in August, will sometimes be a valuable preventive of injury by many insects. If new ground is taken each year for plants, but little trouble will be experienced with insect enemies. I find the ravages of the strawberry worm are wide-spread, and growers often do not know what remedies to use, or how or when to use them.

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## BEST NEW VARIETY OF STRAWBERRY.

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BY R. D. M'GEEHAN.

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As this report is intended for the new varieties only I will mention those that have been introduced to the public in the last five years. The past season has been very favorable for a large yield of fruit as we had plenty of rain from about the 20th of May until after berries were all gone, hence the crop was the largest in ten years, but the color and flavor of fruit was not up to the standard. Some of the soft varieties would commence decaying on the vines before fully ripe,

but few varieties would do to ship after the first week of picking. For twelve years I have each year fruited from five to twenty-five of the new varieties as they were introduced, noting their behavior and those that gave promise were retained, while all that failed to come up to our standard varieties were destroyed, hence I have fruited several hundred varieties.

*Warfield No. 2 (p.).*—I place this at the head of all others I have thoroughly tested. I have grown this four years, fruiting it extensively the last two. It produces more fruit, larger size, better shipping quality than Crescent, its great beauty, large size and good flavor will sell it in any market. It brings in Omaha and Council Bluffs from fifty to seventy-five cents more per case than Crescent. I shipped it last season to Mitchell and Huron, Dakota. It was twenty-four hours on the road, was transferred three times, yet it arrived in good condition and sold for the best price of anything on the market. It is hardy, healthy, and a good grower, makes as many plants as the Crescent, ripens as early and holds out to the last. Its color is dark red, glossy, looks as if varnished, very regular in shape, being cone shaped with slight neck, very easy picked and it will speak for itself wherever it goes.

*Haverland (p.).*—I have had this on trial four years. It succeeds about everywhere tried. It is healthy and hardy, a good grower and very productive. The fruit is large, long, and moderately firm, of medium quality, bright red in color and handsome, ripens all over at the same time. The fruit stalks are tall but not strong enough to support the heavy load of fruit, hence must be well mulched to keep the fruit clean, ripens about the first and holds out about as long as any.

*Bubach No. 5 (p.).*—This I have fruited four years. It is perhaps the most popular very large berry yet introduced. Forty berries of first picking (as they run) filled a quart box. This season it was too soft after the first rain to keep over night, and many berries commenced spoiling before fully ripe on the vines. It is the most productive of any very large berry we have fruited, only medium in quality, and very pale red color. The plant is all that could be desired, but the large size of fruit is about all I can see about it to recommend.

*Jessie (s.).*—We have fruited this four years and for the amount of blowing that was done about this variety when first introduced it ought to beat all others. The first two or three pickings the fruit is

of good size, after that the berries run down small. The quality and flavor is first class, either for eating fresh from vines or canning. The plant is large, healthy and hardy, and a good grower. Its blossoms are easily killed by the frost. Cold rains at blossoming time will often kill them. It did the best for me this year it has since I have been growing it. Yet the Warfield, right beside it, produced four to its one. The quality and flavor of fruit is all I can see about it to recommend it.

*Racster (or Beder Wood) (s.).*—We have fruited this two years. I will describe this by giving what Mr. Crawford of Ohio, one of the oldest and most experienced growers in the United States, says about it: "This is very early and enormously productive. The berry is large, roundish, always of regular form, bright scarlet and of good quality. The plant is in every way satisfactory and its blossoms are perfect.

We can endorse all of the above and say further that from present appearance it will supersede all the staminate now in cultivation as a fertilizer for Crescent, Warfield No. 2, Bubach No. 5, and other pistillates. It is a great plant maker and must be kept moderately thin in rows to produce good sized fruit.

*Cloud (p.).*—I fruited this two years and now plow it under as worthless, with pine apples, pearl, and many others.

The following varieties I have fruited but one year:

*Crawford (s.).*—This originated with Mr. Mathew Crawford of Ohio, and I consider it the best of his many seedlings I have yet tested. The plant is large, stalky, healthy and hardy, a good grower, making a fair supply of strong, healthy plants. The fruit is among the largest, running from three to six inches in circumference, holds its size well to the end of the season, the shape is round to conical, with a slight neck; color, bright glossy red, handsome; the flesh is of light pink, very firm, making it a good shipping or canning berry; the quality is excellent and very productive. Season medium to late. If this variety continues to do as well as it did this year, I will consider it one of the most valuable large berries we have; its size, quality, and beauty will sell it in any market and its productiveness will make it profitable to grow for market, where large, handsome fruit of extra flavor will bring a fair price. Mr. Crawford has grown them that twenty-

one berries filled a Disbrow quart basket heaping full. I suppose they were grown in hills.

*Great Pacific (p.)*.—This variety is a great grower with very tall foliage, leaves stand from twelve to sixteen inches high, makes a great quantity of runners from two to two and one-half feet long before setting a plant; healthy and hardy; the roots are very long, frequently twelve inches. The berry is large size, beautiful bright red in color, moderately firm, good quality, ripens all over, rather long in shape, sometimes wedge-shaped. The fruit stems are large, but the big load of berries bends them down; ripens medium to late. It has the appearance of being one of the most productive varieties. If so, the size, beauty and quality of fruit will recommend it in any market. But few varieties were any more productive this year than it.

*Parker Earl (s.)*.—All things considered this, in many respects, beats anything we ever saw of the strawberry kind. In the first place it is the largest plant with the longest and most roots of any on our ground. Plants received from T. V. Munson, of Denison, Texas, the first of April, 1890, the first of June, 1891, measured twelve inches around the crown, and some of them had fourteen fruit stems with ten to twenty berries on a stem. When the berries commenced ripening they were from one and one-half to two and one-fourth inches long, cone shaped, and from three-fourths to one and one-half inches in diameter, bright glossy red, very handsome, good quality and firm. It is medium to late in ripening. It made but few plants, but what it did make were monsters, it being so thin and raw, I judge, is why they grew so large. Mr. Munson says he raised 15,000 quarts per acre on light, sandy soil, two years in succession on same bed, and I can readily believe it, from what a row twenty feet long did for me this year. If it continues as it has begun this variety must become popular, as the plant is healthy, hardy and a good grower, the blossoms being perfect. It will be an excellent fertilizer for the pistillates, but unless they make more plants than mine did last year they will always be high in price. I would say to every strawberry grower, try a few Parker Earl; you can't lose much, and may get something better than you ever tried. A number of people saw this fruit when ripening and they all say they never saw its equal.

*Michel's Early (s.)*.—I see nothing to recommend this variety, except that it ripens a few berries a little earlier than Crescent. The fruit

is medium in size, of very good quality, but of a pale, dingy color, and it won't sell in any market I could find while there are any others to be had. As to productiveness any of our standard varieties will produce twice the amount of fruit. A berry must be bright colored and handsome to attract the eye, or it will not sell.

*Warfield No. 1 (s.).*—Healthy, hardy, a good grower, moderately productive, fruit almost identical to Captain Jack; firm, handsome, very fair quality. Worthy of further trial. This is what Mr. Warfield uses principally to fertilize his No. 2.

*Eureka (p.).*—Good grower, makes lots of plants, healthy and hardy and produces a good quantity of berries of large size at first but soon gets small. Only medium in quality. Berries quite irregular in shape; not desirable where we have so many others that are better.

*Tippecanoe (c.).*—Plant robust and hardy, a good grower, but the foliage rusted badly soon after fruit commenced ripening. The first berries were very large, bright red, globe shaped, handsome and good quality. If it had matured all the fruit set it would have been productive. I will not condemn this until further trial.

*Lady Rusk (p.).*—This variety was very highly extolled when first introduced by Mr. Stahl, of Quincy, Illinois, but as grown on my grounds I can see nothing to recommend it but the shipping quality. The berry is of fair size but rough and uneven in shape; very sour and poor flavor; and the crop runs about the smallest of anything on my grounds. I shall plant it another year but I have little faith in it.

*Strayman's No. 1 (p.).*—A good grower, makes lots of plants; healthy and hardy. The fruit is fully as large as Crescent; bright red, moderately firm and very productive; ripens at the same time as Crescent. This is well worthy of further trial.

*Daisy (s.).*—A handsome, bright red, glossy berry; of good size and quality; ripens medium late; firm and fairly productive.

*Mrs. Cleveland (p.).*—Large berry; glossy red; moderately firm; fair quality and fairly productive.

Anna Forest, Florence, Miami, and about a dozen others, I fruited this year for the first time; none of which I consider worthy of description or to fruit another year, especially when we have so many that give promise of being so much better. I would now say that for one year's trial the Parker Earl, Great Pacific, and Crawford stand at the head of all the varieties tested this year. All of these will cer-

tainly be propagated largely in the future, unless they show some defect I have not discovered in one year's fruiting. Of the varieties that I have fruited from two to four years, the Warfield No. 2 stands decidedly at the head of all others, old or new, for all purposes that we grow a strawberry—which is money—but it must have a fertilizer, and for that purpose I would use Racster, as I know of no other staminate variety that has produced as much good, marketable fruit the past two seasons as it.

The Haverland is also very productive, good size, handsome and fair quality, but not so firm as Warfield, and also a pistillate. I don't consider it the equal of Warfield in many points, yet it is a good one.

#### DISCUSSION.

DAY—I should very much prefer taking Mr. McGeehan's opinion of strawberries in preference to Mr. Crawford's. We can "bank" on Mr. Crawford's experience quicker than any eastern man. Western Iowa is similar to Nebraska. Must say President Taylor's ideas in regard to McGeehan are good—no better man. Have been acquainted with him for ten years; have more confidence in him every year. When we get acquainted with such a man, let's hold him. In regard to Michel's Early I have a friend in Arkansas who sent me some of the plants. My friend calls it Mich-el's Early—short sound of "i". Have not fruited it yet, so am not prepared to say much of it.

STEVENSON—We have no strawberry better than Michel's Early; it is of good quality, and early; not very good color.

DAY—They are good color in Arkansas.

MARSHALL—Crawford says in the north it is too small.

PRESIDENT—Let us talk all we can about strawberries now, as we may not have time to bring up this subject again.

MARSHALL—I can say I have had good success with Michel's Early.

PRESIDENT—Any questions in regard to time or methods of planting would be in order now.

DAY—If any man has planted in August or September, we would like to hear from him. The time and season is a great thing in favor of fall planting; if we can recommend it, let's do it; if we cannot, we must condemn it.

HARRISON—If we could move eastern climates out west we could

plant in August or September; but our seasons will not do for fall planting.

MARSHALL—I prefer spring.

HOGG—I have planted strawberries from early spring to September; and April planting has proved best with me. Planted one patch in July, and it did very well; yet I could not recommend that time, as it was an exceptional season. The best time to get good stands is in spring; by proper treatment you are sure of having your plants grow.

JENKINS—In the west-central portion of this state August planting is a failure.

STEPHENS—If the weather is favorable I would plant any time; if unfavorable, would wait till spring. The average man will succeed better in spring; you cannot succeed readily in the fall unless you use the potted plants. In spring the earlier the better for planting. Those that are set late in September do well if established before winter. As soon as you can get plants strong enough, plant your strawberries.

REED—I suggest that we import the Ohio rain-man to give us favorable weather.

MARLATTE—My experience is the same as those here. I planted a few that I raised myself this fall, and I planted them with the soil attached to the roots. I took a common flat basket, selected good plants, lifted earth with the roots, carried them in the basket to where I wished to set them, set them solid, and had no trouble with them. They grew and did well last year through the drouth, and raised quite a number of plants from the runners. This spring they made a nice growth. We had Bubach's five and five and a half inches in circumference. We sold at fifteen cents per quart; some for ten cents. I left the mulch on the ground, and my berries were perfectly smooth and bright. Have rich soil, and fertilized Bubach with Sharpless—two rows of Bubach and then one of Sharpless; then two more Bubach and another of Sharpless. I have the Cumberland and Great American, but do not like the way they rust. They are not half as good as some o' hers.

REED—The only successful way to transplant in the fall is to use potted plants. We took tar-paper, and made little cones similar to the pots used by gardeners; they can be removed from the plants easily, and will last two or three times.

MARSHALL—I went to town and procured a lot of old tin fruit cans



and unsoldered the bottoms. These make good pots, and will last a lifetime. These are set over the plants after they are planted out, and after the first two or three days they can be removed at night and placed back in the morning. I have set out plants in the heat of the day to see if these cans did any good; the result was that these plants grew.

STEVENSON—In my article I spoke about using tin transplanting tubes which cost about two cents apiece. You can move about one hundred of these in a wheel-barrow. I have several thousand pots, but prefer these tin tubes.

DAY—Do you use these tubes for ordinary customers? It seems to me that we should endeavor to create a demand for such plants if they are so much better. We can sell these plants for ten dollars per thousand. I can pot one thousand per day myself.

STEVENSON—I do not think I could afford to sell plants at that rate.

MARSHALL—In regard to the expense: I picked up a lot of old cans, and have used them for three years; can use them for ten years to come. I keep them off during the day.

O. F. SMITH—I am expecting to plant two or three thousand plants myself, and will have my men set them in the cold-frame until they become more hardened. I think if you will do this way you can save every one of them.

HENTHORN—I would like to hear more about varieties. I am not growing strawberries largely, but have been growing them on a small scale for several years, and have tried several different kinds. My idea is that the Warfield's No. 2 is going to be the berry for this country. I think Bubach's is better than Warfield's for eating. Am trying Lady Rusk and Michel's Early, but they have not fruited yet. Warfield and Bubach have been tested, but probably Warfield will lead the others.

BELTZER—I would like to trouble the Society. We had better do too little, than to try to do too much; I do not believe in mixing up so many different varieties.

HEATH—I would like to know the list we recommend?

PRESIDENT—All members of the Society are welcome to reports. Members who pay a dollar are entitled to all back numbers of the reports which are now in existence. We have just discovered that

the 2,500 delivered each year to the state legislature have been carefully filed away—in the cellar! These will be unearthed this winter and given out to persons who will have more use for them than our law-makers did.

WOLVERTON—In regard to the number of varieties—it has not yet been settled. The danger in fall-planting is too great to risk it.

PRESIDENT—All things considered, spring will be the best time to plant.

HOGG—In my patch I have the Wilson, Captain Jack, Sharpless, Manchester, and James Vick, right in rows side by side. Several plants of the Jessie have never borne.

STEPHENS—I have been a little afraid of recommending fall planting. I have frequent inquiries from people in the country in regard to planting strawberries and they think it a good time to plant. In two-thirds of the seasons they fail. Unless one can get plants near home it is not advisable to plant in the fall. From July until in September it can be planted; even in October. On the average, the man who plants 100 can succeed in the fall, while the man who plants largely must use the spring. Also in summer you are apt to get old plants. With average falls you get but few runners, and it takes about two years to get a stand. I usually plant in rows three and one-half feet apart. I would call the one best kind, Crescent—for money.

JENKINS—I think it would be wrong to convey the idea that fall planting will succeed. I am satisfied we lose more than ninety per cent. This year must not be taken as a criterion; we are not getting Nebraska weather this time—it is an exception.

PRESIDENT—Page 156 of the 1891 report will show what varieties are recommended for this state.

DAY—Last winter we seemed too busy to revise our fruit list; we used the same one that had been recommended the year before.

GAGE—Most every one wants to know the “whys” and “wherefores.” Tell any one something and he wants to know why. It seems to me that the reason for all this is that they are fully mature. With all plants I have had experience with, if you can get them perfectly dormant you will have best success. In the summer the strawberry plant is just as soft and growing as it can be—if transplanted it is almost sure to die, unless very favorable weather sets in. Plants look

so much nicer when they have green leaves on them that many persons think they must be better. I think the best time to set them is in the spring before the leaves have started.

HALL—One spring I was very anxious to get my strawberry plantation started and I went into it and set out part with these early plants; afterwards when the plants commenced to grow I set late plants; those set early did not grow at all, and the later setting grew very nicely.

MARLATTE—There is a point, if I can have my time I want to plant just when it is fullest of life—it will grow best.

REED—Would like to endorse what Mr. Marlatte says. Any tree will grow better if set when in fullest life. Wait until the plants are just beginning to grow and they will keep right on. I find this is true in planting out osage.

HARRISON—You want to make an exception to cherry trees; it would not do at all to wait until they are out in full swelling buds—they would die. I plant these just as soon as the ground will permit.

BELTZER—We should have some central point on which to talk; we ramble about too much; first on this thing, and then on that. We should have embodied in our next report what is the best time to plant. Let this be decided fully. Then what is the best variety, or the two or three or four varieties which are about equal in merit. Have this fully decided, too. It seems to me that we consume a great deal of time in saying things that should not go into our reports at all. We want to place in our reports what is the best time to plant strawberries—in the spring or in the fall. I do not sell plants for fall planting at all.

DAY—My experience in planting strawberries is to plant when the leaves are on. Have had strawberry plants sent from Illinois that were in full bloom, and they did well. To have the main part of the foliage just bursting forth, when the leaf stems are three or four inches high, is my choice time for planting strawberries.

## BEST OLD AND NEW VARIETY OF CHERRY.

BY E. F. STEPHENS.

MR. PRESIDENT AND FELLOW MEMBERS: The topic of "Best Old and New Variety of Cherry," assigned to me, is one in which I am much interested, having found the cherry not only desirable for family use, but also a source of profit in commercial orcharding.

In Nebraska the bulk of the cherries as now grown are Early Richmond; followed later mostly by English Morello, and a few Late Richmond; and within the last three or four years a few Ostheim have been planted. The difficulty that we met with in the Early Richmond is that it is not quite as hardy in the fruit-bud and the tree is not quite as hardy as we could desire. Whether we could discover varieties with the productiveness of the Early Richmond that should have good quality, be hardy in tree and fruit-bud, has been a point of much interest to the fruit-growing fraternity. So far we have no cherry that produces as many bushels to the tree, when the season is favorable, as the Early Richmond. It is a free grower, bears freely, gives fruit of good quality, and no doubt will continue to be grown freely for a considerable time to come. Speaking of it commercially, at the time the Early Richmond is ripe there are a great many cherries on the market, and prices are apt to rule low. If we could now develop varieties of good size, quality, and fruitfulness, with the trees hardier than the Early Richmond, we should have a decided acquisition.

Along this line of experimentation a great deal of attention has been given to some of the newer Russian and German varieties, in the hope that among them we should be able to find trees not only much hardier than those we have been planting, but that should have sufficient quality. Although not arranged in their order of merit, but as I happened to jot them down while looking them over this afternoon—the 27th of July—the following are among those that I have tested, and I note first the

*Minnesota Ostheim*.—It is very much like the common Morello, a

thrifty, hardy tree, having apparently but little value, as the fruit is too small.

*Susse Fruhe Weichsel.*—Is a tall upright grower, fruit of fair quality; but not yet fruited long enough to say positively enough in regard to it.

*Spate Amarelle.*—Trees smaller in their habit of growth than the English Morello, apparently hardy, fruit medium to large, color dark purple, season about the 20th of July.

*Schatten Amarelle.*—The word "schatten" is said to mean shadow. It is much like the above variety in size, shape, quality, and season of fruit; has borne only a few specimens, and I cannot tell much about it.

*23 Orel.*—Tree promising, but has not yet fruited enough to judge intelligently.

*Brussler Braune.*—A variety which I should judge would have considerable merit, and which is well worth our attention. I hear it spoken of very highly in western Iowa, and I like its appearance in the nursery, and have planted quite a number in the orchard. It has not yet fruited enough to speak intelligently of its flavor, further than what I can hear about it. The trees had a few specimens on this year. Season about like the English Morello.

*Lutovka.*—This tree is a fine grower, and I am much pleased with it, and like the fruit, which is a little larger than the English Morello, and of considerable better quality. I think that it would be a very desirable variety.

*Bessarabin.*—We regard this as a good tree to plant along the roadside. It is a free grower, and makes a tree of large size. The fruit seems to be of fair quality.

*27 Orel.*—Strong growing, hardy tree, evidently quite late, as the fruit on the tree this 27th of July is not ripe enough to judge of its quality.

*26 Orel.*—This is a promising variety and a nice looking tree, something like the Dukes in appearance and habit, and evidently of good quality. We shall watch it closely, as we hope to know more about it in the near future.

*25 Orel.*—This is a good variety of tree, not yet fruited sufficiently to judge intelligently.

*Vilne Sweet.*—We regard this as a very promising variety, and

nearly sweet. We think that it would be well to keep watch of it and test it further.

*Wragg*.—From north-central Iowa. Seems to be a healthy, vigorous tree. The fruit is rather late, being sometimes near the English Morello in season. There are a few specimens hanging on the tree that stands in a shaded position, but they are rather green. The tree has borne quite freely, and I should think that it would be a healthy tree as well as a free bearer.

*Dychouse*.—This is a free grower, apparently hardy and healthy. The fruit is not of good character or quality, and I do not think that I could recommend it. It ripens from July 15th to August 3d.

Five or six other varieties are being tested, but as they have not yet fruited we cannot report on them with confidence.

*Yellow Glass*.—We would regard this as a very promising variety. Fruit of good character, firm enough to be shipped a long distance, very nearly sweet; and the tree should be watched carefully.

*Ostheim*.—We regard this as one of our most valuable varieties, and one that has come to stay. It appears to be considerably hardier; fruit a little larger and of better quality than the English Morello; and I feel sure that this will be one of our future varieties to plant commercially.

Alongside of the Ostheim we would watch closely the Lutovka, Yellow Glass, and with the other varieties mentioned above, experiment longer before planting them freely for commercial purposes. For some time to come I think that people will continue to plant the Early Richmond, probably moderately of the Montmorency, freely of the English Morello and the Ostheim, and after we have experimented with them longer, no doubt the Lutovka, Vilne Sweet, Yellow Glass, and some of the Orel and Amarelle families.

I would like to remark here that most people do not plant cherries enough to supply, first, the birds; second, their neighbors, and finally, themselves; and seeing their crop disappearing rapidly they are inclined to pick the cherries before they are ripe enough to attain their best qualities. It is now the 27th of July, and nearly all of the English Morello have been marketed, and yet a couple of thrifty trees north of my house promise to carry their fruit, or as much of it as we do not pick off, until the time for the meeting—a week hence. I notice that they are getting better every day. The Early Richmond, which

were all picked commercially the 25th of June, I find have a few yet clinging to the trees.

Nearly all the varieties will remain on the trees from two to three weeks longer than they are allowed to remain, and they are getting better all the time.

#### DISCUSSION.

HARRISON—This cherry question is one of intense importance; it brings in plenty of returns. Although the Early Richmond is said to be tender in the fruit-bud, we place it first on the list. Plant low-headed trees, which makes the fruit easier to pick and we think is some little protection against frost if the head is compact. Our Early Richmond trees produced one bushel per tree this year. After the Richmond comes the Large Montmorency, larger than the Richmond, and more meaty. If left to itself it will stand the sun; is a remarkable hardy tree. I have a few Russians that Brother Stevens has not mentioned—Riga and Griotte Imperial. The Griotte Imperial is a large black cherry; seems to be a cross between the sweet and sour varieties. I think it will prove one of our valuable varieties when it has been tested further. Ostheim I find to be a rather shy bearer, but I think after the trees get their growth they will do better. We need something better in the cherry line than we now have, and I believe these Russian and German cherries will help us out. I have planted two thousand of them, and will plant about two hundred more each year. In regard to setting cherry trees, they should be set the very first thing in the spring. I do not wait until the buds begin to swell. I am not in favor of pruning cherry trees; get good, well-balanced trees, and let them trim themselves. I think we can raise fruit in the western part of Nebraska, but it will take much perseverance to determine the best varieties. Put a mulberry hedge around your orchard. The mulberries are not entirely useless, as they furnish many berries for the birds to eat; and I have found that mulberries and cherries mixed make very good sauce.

DUNLAP—I do not think it is a good plan to leave cherries a long time on the tree. We have a tree or two of English Morello on which the cherries were left quite a while after the others were gathered. I paid but little attention to them until one day when some person came to our place and wanted some cherries. I referred them to those trees. Presently they came back and asked if I had any

other cherries, as these were spoiled. I tried them, and sure enough they had soured.

STEPHENS—They were certainly not mature when they soured, or the tree was diseased in some way. The only way I can account for cherries souring on the tree is that there were probably not enough leaves to fully mature the fruit. We estimated our crop at 900 bushels this year; but we sold only a little over 600. We figured that the birds ate 100 bushels, persons 100 bushels more. Many of our neighbors came to pick on the shares, and, as we have cherry trees to sell, we let them pick that way; although if we were growing fruit exclusively we would not want it gathered on that plan.

JENKINS—Last year I planted Ostheim cherry trees, little one-year trees; fully eighty per cent lived. This year about one-half of them had a few cherries on. Many of them were little trees not over three or four feet high.

HARRISON—The Olivet is not a success; it ripens a little after the Early Richmond.

REED—Leaving cherries a long time on the tree is all right; we tried it and ours did not sour a particle.

JENKINS—We are using the English Morello now for table use; of course we are further north than this, and it makes some difference in the time of ripening.

HOGG—This season my Early Richmond trees blighted somewhat, and before the cherries were fully ripe quite a number of them bursted and fell off.

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## PROPAGATION, PLANTING, PRUNING, AND CARE OF THE CHERRY.

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BY C. Q. DE FRANCE.

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This question covers a good deal of ground, and if I should fall short in any of the different phases thereof, the Society will kindly correct the error before submitting this paper to the public.

Beginning, as the question does, with propagation, we believe the Secretary meant for us to follow the cherry from its infancy up to and including its maturity.

By propagation we understand it to mean that process used in pro-



ducing trees of a given variety, and in discussing that part of the question we shall merely mention the method most generally in use, and the one which gives the most satisfactory results. Budding has met with best success in the west, and seems adapted to producing good, healthy trees at nominal cost. We are aware that grafting has some advocates in different parts of the state; but this method of propagation is but little practiced as yet, and has not been sufficiently tested to warrant our using much time in its discussion.

The Mahaleb stock is most generally used in budding the cherry in Nebraska, and in fact in almost the entire west. These are purchased in France, through some of the prominent nurserymen there, the medium stock—about three-eighths of an inch calibre—being the grade most desirable. These usually arrive about the middle of February, and are planted out in nursery rows as soon as practicable. During the first part of the season they are carefully cultivated to induce a good healthy growth. About the last of July or first of August, owing to the season, they are gone through and all the lower branches carefully removed, in order to present a smooth, clear surface in which to insert the bud. Then the budders follow up and insert buds of such varieties as are thought most worthy of cultivation in this state, the Early Richmond, English Morello, Ostheim, Large Montmorency, Late Richmond, Wragg, Dyehouse, and several others being held in most esteem. Having a clean surface on which to work, the budder works very rapidly, inserting often as high as 2,500 buds in a day; he is followed by a wrapper who ties a strip of raffia, or East India hemp, about the bud in such a manner that it presses the cut portion of the stock firmly against the bud. In about two weeks these buds are carefully examined, and if the wounds have begun to heal nicely the strings are cut at the opposite side from where the bud is inserted to prevent injury to the rapidly growing stock and the bud as well. These buds being inserted after the growing part of the season is far advanced, do not start to grow, but remain in a dormant state until the next spring. As soon as the stocks start to grow the next spring all that portion above the bud is cut off to throw all the sap into the bud and thus produce as large a growth as possible the first year. Often trees so treated will make a growth of three feet in the first season. The second year or third year after the buds have been inserted the trees are ready to be set out in orchard; and this brings us to the second part of our subject, planting.

In planting an orchard wholly of cherry we would put them only eighteen feet apart each way, as it saves space, causes the trees to shade the ground more quickly, and, if the matter of fertilization is taken into consideration, makes that more easily effected. As you have just listened to a paper on the best old and new varieties of cherries, it is not my province to enter into a discussion as to the relative good qualities of this or that variety. However, aside from the promising new varieties which are now laying claim to prominence, we would advise a goodly number of Early Richmond, English Morello, and Ostheim. As to the manner of planting, it seems superfluous to go into details, yet, when we realize that what is common property to members of our Society may fall into the hands of persons who have not learned these lessons, it may be that it is better to do so; and when we go to ignoring facts and methods already known to this Society, and try to write something new, it seems to me that a blank piece of paper would be the most appropriate thing I could present you. Regarding the methods employed in planting the cherry, I would say that the first and most important thing is to get your ground in proper shape. Too many persons overlook this when planting any kind of a tree, thinking they can make up any deficiencies when the time comes to cultivate. Again I say, I regard thorough preparation of the soil as the most important step—"work well begun is half done."

Plow the ground just as deep and well as you possibly can, harrow thoroughly, procure a line the length of the rows you propose to plant and stick a pin through it every eighteen feet, or whatever distance apart you intend to have your trees; stretch this line down one side of the field and space off one end at right angles thereto, in order to have your rows straight both ways; then take pegs and stick into the ground along the line wherever a pin occurs; raise the line and stretch it for the second row; peg this also, and thus continue until the whole ground is pegged. Take a board eight feet long with an inch hole bored at each end, or six inches back from the end; in the middle of this board cut a notch about half way across large enough to admit the trunks of the trees you intend to plant; place this notch against the peg already set, stick a peg in the holes at either end, lift the board, remove the center peg, and dig the hole. Right here do not let a little

work stand in the way of making a good big hole—make it plenty large to admit all the tree's roots without bending or twisting them in the least, and make it deep enough to set the tree quite a little deeper than it grew in the nursery. Some persons advocate setting cherry trees deep enough to cover the place where the bud was inserted, and this plan seems to be a good one, as it leaves none of the original stock exposed. Then when you are ready to set the trees, place the board back on the outside pegs, set the tree with the trunk close up in the middle notch and fill in the loose soil about the roots; pack it in firmly so that all the interstices between the roots are filled up. This will make your trees exactly in line; but if you are not very particular you can dispense with the notched board system and rely on a true eye to get your trees in line; the main thing being to get your trees planted in such a manner that they will grow under any ordinary circumstances. Many persons are afraid to pack the soil firmly about the roots of a tree, and this one thing has caused the death of more trees, I suppose, than all other causes combined. Of course I do not mean that you shall pound in the soil if it be rather wet, but, as it should be, moderately dry, there is very little danger in packing the soil too firmly. After planting, the cultivation should be thorough and often. Keep the weeds down and always have a mulch of fine, pulverized soil to retain the moisture. We do not advise deep cultivation as it allows the soil to dry out too deep, but rather, a thorough fining of the soil down to a depth of, say, two or two and one-half inches. In a very dry season, a constant stirring of this fine soil will prevent the escape of moisture from below. The theory of this is well known, and has been explained so many times by scientific men that it is not necessary for me to enter into details.

In regard to the best crop to plant in the cherry orchard, I would think corn the best for the first two or three years, or until the trees begin to bear, and after that I would prefer to have nothing at all planted, but continue the cultivation as before. Nebraska has such a rich soil that many persons think it is practically inexhaustible and for this reason no fertilizers are necessary; however, it seems to me that fine barn-yard manure applied near the trees—not touching them—would prove of much benefit.

I would not advocate very heavy pruning, but would take care in the start to get trees with low heads, well balanced, paying particular

attention that none of them had forks, as these will prove detrimental by the time the trees get to bearing. Then as the trees continue to grow, go over the orchard and remove any young growth that might be an obstruction before it attains a large size. I am a firm believer in the old adage, "just as the twig is bent the tree's inclined," and it holds good in pruning. It is the early care that produces the symmetrical tree. Cutting off large limbs cannot but be a detriment to the tree.

To prevent rabbits from peeling your trees, I believe the plan of tying four or five cornstalks around the trunk, is, on the whole, the cheapest and best. Some persons advise killing a rabbit and rubbing its flesh over the bark, as a sure preventive; but we are not certain that this plan is effectual; the former has been tried for years, and its good results recommend it to all. Careful observation will show if insects are seriously affecting the trees, and prompt action should be taken in the matter; spraying with arsenical solutions proves most effectual in such cases, but care should be taken not to make them too strong. Lately I noticed a letter in the agricultural department of the *New York Sun*, from a subscriber in Kansas, bitterly denouncing the idea of spraying with arsenical solutions, and saying that he would as soon use a spray of nitric acid as the former; he had used the solutions and utterly ruined his trees. The editor in replying to him said that many persons who had never before used a solution for spraying acted on the principle that if a little is good, a large amount is better, and in consequence made the solution too strong, resulting in the destruction of the foliage. That persons having experience in spraying cannot too strongly impress upon the minds of amateurs the necessity of making spraying solutions strictly in accordance with the formulas prescribed.

Years ago, when there were but few orchards in Nebraska, there were but few insects to trouble the orchardist; his only bug-bear was the drouth. Now the conditions have very materially changed, and although the drouths are less frequent, the insects are increasing very rapidly. Within a very few years from now the successful grower of fruit of whatever kind must be constantly on the alert for insect depredations, and must, of necessity, resort to the most expeditious methods of extermination. I am not qualified to treat the subject of insect depredations in a practical and scientific manner, but all readers

of the works of this Society can gain much information from a careful study of the entomologist's reports and papers.

One of the chief cares of the cherry orchard will be to prevent insects from injuring both tree and fruit; and the knowledge thus gained will not come amiss in the growing of other fruits.

Gathering and marketing the fruit of your cherry orchard properly belong to another paper; hence, we will merely touch these points and pass on. By having low-headed trees the cost of picking the cherries is materially reduced; the lower limbs being accessible from the ground, and the higher ones easily reached by an ordinary step-ladder. Pick stems with the cherries, as they retain their freshness better. Market in quart boxes packed in twenty-four quart cases. We like the Leslie box as it allows better ventilation than the common square one. Make a reputation of giving full measure, with just as good cherries in the bottom of the box as on top; and once having gained the people's confidence, keep it.

Regarding the profit in growing cherries, our friend Stephens can tell you as well as any man in the Society whether it pays or not. It occurs to me that he said in an article on small fruits, read at Crete a year ago, that if he could be allowed to include cherries under the head of small fruits, it was the most profitable small fruit he had. Coming, as they do, at a time when money is usually rather hard to get on account of scarcity of products to command it, it seems to me that the growing of cherries for market, on a moderate scale, is a very profitable undertaking for any man who is willing to devote a part of his time to their cultivation.

#### DISCUSSION.

GAGE—We use the Mahaleb stock—a non-sprouter. It is mostly used in propagating sour cherries, and Mazzard for the sweet ones. We do not propagate sweet cherries as they are not a success in this country and for what few calls we have for sweet cherries it is better and cheaper to buy from some eastern person. In budding we sometimes get a good stand, and sometimes we fail. With thrifty growing, stocks we have the best success. We have always budded with a small portion of the wood in the bud; but this year the G. J. Carpenter Company intend to remove a portion of the wood. In winter we protect by plowing up the trees. We bud in August. The seedlings

are imported, and planted out as early as possible in the spring. The Mahaleb is too tender to be raised in the north.

REED—Have you ever used native stocks?

GAGE—No, we have never experimented with native stocks.

REED—Heikes, of Huntsville, aims to grow his own seedlings from seed imported from France.

DUNLAP—Could not we grow the Mahaleb here?

PRESIDENT—The Mahaleb is not more hardy than the peach. We lost a great many buds one winter by not having them covered; now we cover them up entirely, so that no bud is exposed; but if we could depend upon snow for mulch, no earth would be necessary. What can we use in the place of Mahaleb? It is not a parallel case with seedling apples; with them we use a small portion of the root, and it is put down deep into the ground where it is not exposed to the frosts of winter. With the Mahaleb we must either bank up with earth in the fall or lose a large percentage of our buds. Last year I had corresponded with Prof. J. L. Budd in regard to the sand cherry as a stock for budding. He has found ordinary cherries to unite with it very well. If it will serve this purpose it is an acquisition. I ordered a lot of sand cherry pits to be sent to the Experiment Station. We may get some sorts that will prove good for fruit, and if we can find a better stock than the Mahaleb we shall have done well. I hope that as many as have the opportunity will get pits of this sand cherry, plant them, and try the seedlings as stocks. By united effort in this matter we can soon demonstrate whether the sand cherry is valuable as a stock or not. Some claim that it is too small for our purpose; when I was up in the northwest I saw some that would do nicely, so far as size is concerned—they were fully as high as a man's head. The Mahaleb is not larger than *Prunus domissa*, or the common wild black choke cherry. In writing up my trip to the northwest I mentioned the sand cherry as the probable parent of cherries adapted to that region; also that it might be used as a stock. Mr. Langdon has just handed me a clipping containing the letter which Prof. Budd wrote in regard to using the sand cherry as a stock, and I will read it:

“SAND CHERRY FOR STOCKS.

“I have just read the interesting notes of friend Taylor on the native fruits of northwest Nebraska. He expresses the opinion that the future stone fruits of that region must be developed from the na-

tive forms. I feel like suggesting that we need not wait for this possible improvement of the native cherries. The really excellent cherries from the province of Vladimir, 150 miles northwest of Moscow, Russia, are, I have reason to believe, as hardy as the sand cherry of northwest Nebraska and west Dakota. The thing at present needed is not the iron-clad cherries that will thrive in a dry climate, but a root that will endure that soil and climate to graft and bud them on. Hence, I picked up my pen to say that I believe the sand cherry (*Prunus pumila*) is that hardy stock needed. Professor Bessey kindly sent me two years ago pits of this cherry gathered in the Black Hills. The seedlings of these grew up as straight and stocky as the Mahaleb stocks we import, and they bud as nicely as any stocks we ever used. The colored juiced cherries, such as English Morello, Wragg, Ostheim, Shadow Amarelle, Spate Amarelle, Shubeanka, Orel, and others do not unite even passably well with the Mahaleb. The buds grow well for two years, but there is no real union of the cells of stock and cion, and they prove short-lived and unprofitable. But these valuable cherries unite perfectly with the wood of the sand cherry, and will, I believe, make durable trees. Those who have seen the sprawling plants in their native haunts will hardly believe that under culture the plants are as stocky and upright when young as the Mazzard or Mahaleb. To illustrate this tendency, I will say that last winter we grew a few sand cherry plants from dormant cuttings in the plant-house. When these were put out last spring in nursery row they had just a show of top, not more than four inches long. Yet when budded in August the stems were as large as those of our Mahaleb stocks last spring, and they were quite as upright and as easy and convenient to handle.

"I will say in connection that the seedlings of the wild red cherry of the northwest (*Prunus Pennsylvanica*) make strong growth when young and bud as readily with the colored or uncolored juiced cherries as we could wish. I am also glad to say that the trees promise to be durable, and that the union of wood seems perfect. During the recent extended drouth our trees on this stock have made more growth than on any other stock used.

J. L. BUDD."

NEFF—My experience with the sand cherry as a stock is this, every bud "took" and seemed to do very well the first season, but the next

#### DISCUSSION.

year all of them died. What caused them to die I do not know; it may have been on account of dry weather.

HARRIS—The cherry will grow passably well on the common wild plum, but these stocks will sprout.

WOLVERTON—Does this sand cherry sprout?

NEFF—No; I do not suppose it will sprout at all except where the roots are broken.

LANGDON—I have a friend who has the sand cherries growing in a cultivated state for the last eight years. He says they do not sprout.

HOGG—I would like to ask about sprouts from the Morello cherry; I would like to know if it would be profitable to plant out these sprouts? My neighbors tell me these trees are very hardy.

GAGE—In regard to the early Richmond on its own roots, I was in Kansas one spring and saw a man who had lots of them; he claimed they were equally as good as budded trees. I set out thirty of them on my own land, and they have never borne until this year. I am satisfied they do not bear as well as budded trees, for budded trees of the same age have given us several very good crops.

NEFF—The stock has a good deal to do with the size and quality of cherries. On plum the cherry is larger than on its own roots. The only trouble with the plum as a stock for the cherry is that the buds do not make perfect unions.

FREDENBURG—I have trees eight and nine years old that are sprouts of Early Richmond; they bear fully as well as those that are budded.

REED—Early Richmond on its own roots will not bear so soon as budded trees, but they grow larger. I think they will be much longer lived. Would suggest planting budded trees deep enough so that they can throw out roots from the part above the union.

DAY—I have a few English Morello trees on their own roots, and I am satisfied they are the best trees I have; they are more prolific than those on the Mahaleb. When the Mahaleb was first used as a stock the trees were said to be dwarfs. Am satisfied if we can get the English Morello on its own roots we will have a better tree; one that will bear much more fruit. I am not in favor of early bearing trees; I think it is a sign of early decay—"soon ripe, soon rotted." You will have more fruit in the end if your tree does not bear early.



If it grows vigorously and attains good size before bearing, you will get more fruit.

**BELTZER**—I have sat here quiet until they have trampled on my toes. I have tried to do a straight business. I have told people that the tree on the Mahaleb is the best tree on earth. I have told them that it is useless to plant out sprouts, as they would not bear well, and that they would cause endless trouble by spreading all over the farm. Now, Mr. President, you have sprung a question here to-day that I would like to see settled. If this sprout that comes up from the roots of the Morello tree is the best, the people want to know it, and they want to plant it; and I would like to have the Society endorse it. If it is otherwise let us say so in our report. I have never been deep enough in the nursery business to justify my buying and budding any cherry stocks; I have simply bought them from other nurserymen who do raise them. If you endorse this Morello sprout as the best cherry tree that grows, I shall be able to compete with any of you. I can get them by the thousands all over the country. In my opinion we should be very careful what we recommend at these meetings, as everything is put on the records, and when it reaches the people every word is taken as gospel truth. I ask this Society if it will decide that this sprouting Morello cherry is the best?

**HARRISON**—There are a good many kinds of Morello cherries, and our friend has misunderstood the varieties mentioned. There are the Holland Morello, the English Morello, the common, old-fashioned, sprouting Morello, and others. The common Morello is a veritable nuisance; it will spread all over the place, and the fruit is very inferior. A sprout of the Early Richmond is all right; but it does not sprout very much. I have a thousand trees, and in the whole lot I do not think you could find fifty sprouts. I have a good number of English Morello sprouts, but they do not bear very readily when young. The subject of propagation has to be modified somewhat, according to circumstances; it is possible to get a very few Early Richmond sprouts from trees planted in one's own orchard for our own use. This would not be practicable for propagating trees for the masses; they would be too scarce and would cost too much. The same may be said of the English Morello, but when we come to the common Morello it is a different thing. They are not propagated in any manner save by their own methods of reproduction—sprouting.

The fruit is too poor for anyone to trouble with them if he can get better cherries. So this recommending our members to plant out what sprouts they can get of the Early Richmond and English Morello does not in the least conflict with budded trees. We must use budding as a method of propagation, as it is the only way to increase numbers rapidly. It is true we need a better stock than the Mahaleb, but until we get that, and even if we never do, a tree budded on it is worth many times a sprout from the common Morello.

DAY—I have only one objection to using sprouts for trees; it is too slow. The trees do not throw out sprouts fast enough for our purpose. Where persons must have their trees come into bearing soon, we must use something for that purpose. For lack of getting the best we must necessarily take the next best.

MARLATTE—I have the Black Morello, and it comes from the sprouts; it is larger than the Early Richmond. I had hundreds of bushels this year—far more than I needed, and we gave them to the neighbors.

DAY—I know the Purple Morello, a small, poor cherry, and the tree will sprout all over the country.

DUNLAP—In regard to sprouts from Early Richmond, you can tell by the looks whether they are Early Richmond or Mahaleb. I do not think this Society should recommend anything until it is sufficiently tested to warrant it.

HOGG—I should certainly feel imposed upon if any one should try to sell me sprouts. I can dig up these every year. I think in a few years the persons who depend upon sprouts will find his whole cherry orchard one mass of sprouts. I do not take it to be advisable to introduce sprouts anywhere. Would rather pay ten times the price for good budded trees.

STEPHENS—I think friend Beltzer was trying to have some fun at our expense. The practical difficulty in growing trees from sprouts is that we cannot grow good trees. Not one in ten is a good thrifty straight tree.

READ—People do not want trees that will sprout.

GAGE—I am not growing cherry trees now. These trees of which I spoke before were set out eight years ago; there are about twenty-five of them now; and four Early Richmond are near them that are ten years old. They are all good size and have been cultivated well. The

sprouts have never borne until this year, and then not to amount to very much. Two years ago I planted seventy-five trees for my own use; they are budded trees and I have given them good cultivation. They are very large and this year bore a few cherries. I feel that before the eight years are up I shall be well repaid for my trouble.

STEPHENS—There is not much danger in growing cherry trees too fast.

WOLVERTON—As experience proves that the Early Richmond is much hardier on its own roots than on Mahaleb, I think the Mahaleb does not furnish enough nourishment for the top and it virtually starves to death. My brother grew a lot of Morello trees from sprouts and gave me part of them. I did not care to put them where they would spread all over every thing, so I set them around the barn yard. I then sent to Bloomington for some budded trees, which I planted in the orchard. His trees bear just as well as mine, but I am not bothered so much by sprouting. My trees are all Early Richmond. I get a little better price for my fruit than he does. I do not believe a cherry tree will die because it is budded on Mahaleb roots, but I do think it does not get the proper amount of nourishment.

NEFF—I have proof of that; I left the Mahaleb root exposed one winter and the trees all died. The Mahaleb stock was frozen, but the part above was all right.

WOLVERTON—I would like to ask if any nurseryman here has known or has seen a tree where the top was killed and the root was all right?

DAY—This is easy to account for; our dry falls do it. Our trees actually dry down to the roots. Before now my raspberries have dried down clear to the ground. In regard to sprouting, my Early Richmonds sprouted a little five years ago, and I made use of the sprouts. Since then I have been waiting patiently for more sprouts. They have not sprouted since. I do not object to trees sprouting if they do not spread all over the place. Would not recommend the common red Morello.

WOLVERTON—The Kansas State Horticultural Society at one of its meetings recommended the Morello as a stock to bud on.

LAING—I think the whole trouble with the budded trees is that we do not have enough moisture; if we had not so much dry weather the budded trees would be all right.

## MY SUCCESSES AND FAILURES IN GROWING SMALL FRUITS.

BY J. H. PAGE.

MR. PRESIDENT AND MEMBERS OF THE STATE HORTICULTURAL SOCIETY: Your committee on programme has me down for a paper on my success or failure in the raising of small fruits, and I will try to comply with this request in a rambling way, although I think it hardly fair, not being a member of your Society and never having attended its meetings, to call on me to parade my ignorance before this learned Society.

I settled in Thayer county, Nebraska, in the spring of 1885, on prairie sod, and in the spring of 1887 I set out a few mixed varieties of strawberries which grew very well, and have given good crops each year since. In the spring of 1888 I set more plants, among them Crescent, Finch's Prolific, and Jucunda. In the spring of 1889 I planted May King, Wilson, Kentucky, Jessie, Bubach No. 5, Cloud Seedling, Belmont, Manchester, and Miner's Prolific, received from Rochester, N. Y. Being late in the season when received, I lost a good many plants on account of grubs and dry weather, but saved enough of all, except Bubach, to test them in 1890. The weather was so dry and the sun so hot at ripening time that the berries mostly spoiled before ripe. I saved one plant of Bubach, from which I raised twenty-one. And this spring I set out five rows 525 feet long, and by hard work and replanting, got a pretty good stand of all except Bubach, which all died except two plants left to propagate from. I raised thirty plants from them and set them out this spring (1891). All grew. These were planted seven feet apart and about sixteen inches in the row, and a row of beets, turnips, or carrots raised between each row. Varieties planted on one side, Jessie, Miner's Prolific, and Belmont; on the other, Kentucky, Finch's Prolific, Jucunda, Wilson, and May King; in center, Crescent, Bubach, Manchester, and Cloud Seedling. The rows of plants would average this spring about two and one-half feet wide, and most kinds have made a large growth, especially Cloud, Crescent, and Miner, but all have not given satisfac-

tion in bearing ; the Cloud having very few berries, the Jessie a very few large ones, Wilson very few ; May King, stems too short and berries too near the ground for wet weather ; Finch's Prolific and Jucunda, light crop, too many buttons ; Kentucky, late, a good many berries, but vines nearly killed with rust ; Manchester, the same ; Crescent, loaded with berries ; and Miner and Belmont not far behind. In the 1889 planting the Jessie did some better, the Cloud equaled the Crescent, the Manchester and Miner did well, the Wilson no good. Cloud, Jessie, Manchester, and Miner did much better near a peach tree grove, where the ground was hardest, and where the plants nearly died to death last year. Seasons and situation seem to make little difference with the Crescent. When the proper time comes it is always there with its load of berries. I think the cloudy wet weather, of which we have had so much this year, had much influence over some varieties. Had the weather been drier and more sunshine they perhaps would have done better.

I commenced planting raspberries in the spring of 1887, and have had good success with Blackcaps. Have Gregg, Mammoth Cluster, and Souhegan ; don't know which I prefer. I have a variety (don't know the name) which is a little smaller, several days earlier, and considerably hardier in vine than those named. Have one variety of red ; it was sent to me from Ohio. It is a nuisance with me ; winter kills and sprouts badly. This is the first year we have had any worth picking. Shaffer's Colossal is not much better, and it does not sprout. The berries are coarse grained, and easily pulled from the bushes by the wind. I think if we could have more rain in the fall, so the ground would be wet during the winter, we would have less winter killing of all plants. I think the drouth kills more than the cold. I never cover, have some mulched, but think those cultivated do best.

*Blackberries.*—I commenced planting blackberries in the spring of 1887. Planted Snyder ; bought some Early Harvest which proved to be Snyder. They have produced good crops since old enough. Last year the berries dried on the bushes before they were ripe. I planted at the same time the Mammoth dewberry, which proved to be a mammoth nuisance. (Why nurserymen will recommend such worthless things I can't tell.) I propagated it three years, and have been trying to get rid of it ever since. In the spring of 1889 I set plants of

Snyder, Stone's Hardy, Erie, and Miniewaski blackberries, and the Lucretia dewberry. Last year they gave some fruit, but the sun and dry weather spoiled them. This year they are loaded with fruit. There were but two dewberry plants lived. This spring I tied them to stakes. One of them was loaded with the largest berries I ever saw of the blackberry kind, the others with very small ones. I find the Snyder several days earlier and of stronger growth than the others. The Erie is the largest berry and I believe the best flavored. I think the Snyder among blackberries is what the Crescent is among strawberries, in that it can be relied upon at all times and seasons where it is possible for any berry to succeed.

I have grapes planted four years, Concord, Elvira, Worden, Martha, and Janesville, which bore some fruit the third year. Last year the freeze the mornings of May 5, 6, and 7 killed the grapes and most of the bearing wood. This year I have Concord, Elvira, Janesville, Martha, Moore's Early, Worden, California, Wyoming Red, Niagara, and Empire State that are all loaded with grapes. Lady, Eaton, Moyer's, Early Red, and Salem are not in bearing yet. Trim grapes in November; lay down and cover with old prairie hay. I have always cultivated until this year, when I mulched.

*Gooseberries.*—I have Houghton, Downing, Industry, Smith's Seedling, and another variety of which I do not know the name. Houghton, Smith's, and Downing have a good crop this year, the first since planting. The Industry bore a few very large berries. Bushes not old enough to bear much, mildewed some. They all grow where they are more or less shaded by trees. I think the seasons usually are too dry for them. I use mulch.

*Currants.*—I have Red Dutch, White Dutch, White Grape, common red, Victoria, Fay's, Lee's Prolific (black), and Long Bunch Holland. They have never paid expenses until this year. Lee's and Fay's are not old enough to bear much yet. They are situated as regards shade about the same as the gooseberries. Some are under peach trees where the sun seldom shines on them in summer, and they bear the best. I mulch freely.

*Juneberries.*—Were loaded this year and a beautiful sight they were to look at. Have two varieties, one a little later than the other.

Of *Russian Mulberries* I had bushels to feed the birds, and to give to those who had neglected to plant them, or the better fruits, and wanted something of the fruit kind to eat.

*Situation, Soil, etc.*—My location is the high prairie soil, black loam, very little sand, sloping gently to the north. I have a grove surrounding my orchard and small fruits, except a few rods on the south occupied by a garden.

Raspberries do best at north end of the rows on lower ground. Grapes killed first on trellis next to trees. Have had but little trouble with black cap raspberries winter-killing. I don't cover. Last September the hot winds damaged the canes. I fear dry weather much more than cold, unless it is a late frost in spring.

I do not know what you learned horticulturists call a success in small fruit growing, but I do know, with only my limited experience, that I feel very well paid for my money, time, and work, and have no disposition to abandon small fruit growing.

I came here six years ago last March, settled on prairie sod, and now have all the small fruit we can use (and that is no small amount) and almost enough to supply our village market, and besides those mentioned, have an abundance of peaches and plums, and a few apricots. I had a good many cherries, and in the near future have an abundant prospect for most kinds of hardy fruits. I perhaps planted more varieties of all kinds than I should, but having to pioneer fruit planting where I am, the only way to find out what was best for my locality, was to test them for myself; and although I may meet with a good many failures, I do not regret what I have done. My losses may be a saving to others. My success may be a great advantage.

#### DISCUSSION.

FOOT—A neighbor of mine has a few roots of a plant he calls huckleberry; they are a blackberry. They thickened up in the row very nicely, but last summer the hot winds killed them. This year they came up from the root and gave a very good crop; however, this is not a satisfactory test. They are somewhat different from the common huckleberry of the east. Upland huckleberries are smooth, but these have a rough place at the blossom end. Those in the swamps are different. These of which I speak fruited with the blackberry. The bushes are two and one-half to three feet high.

BESSEY—Without doubt it is the Juneberry; not the old fashioned service berry of the east, but a kind that is widely disseminated throughout the west.

HARRISON—I planted 3,000 of the real huckleberries last spring and lost every one of them. They will not live in this country.

BELTZER—I have had much pleasure in listening to the discussions here, and now I have something to bring before this Society which is a rather delicate matter to bring up—like the man said who had the itch. We have it—not the itch—but something that affects us seriously, and yet we are always laughed at when we mention it. I refer to the blight. When I started down here a number of my friends asked me to inquire about the causes; and if there is a possible cure, it would hardly do for me to go back and tell them that I had not mentioned the matter. I would like to hear Prof. Bessey speak just five minutes upon this subject and then I will keep still.

BESSEY—It is the same old story. I dislike to talk about it, as I have told this Society at nearly every meeting all I know about it. Blight is a disease; it is a disease of the tree just the same as small-pox is a disease of man. They are very similar to each other. When a man has small-pox, minute plants get into him and grow and multiply. Blight has these similar organisms. The fever of the man agrees with the blighted twigs and trunk of the tree. The burnt appearance of the tree indicates a fever. If you take a drop of sap from a blighted tree and place it under a microscope you can see these minute organisms. Prick the skin of a healthy man and insert a drop of blood from the veins of a small-pox patient, and the healthy man will come down with the same disease. This same experiment will hold good with blight and a healthy tree, showing that the diseases are exactly similar. However, there is one difference in the structure of trees and men, and herein lies the reason that blight cannot be cured when it once makes an appearance: man has the power of recuperation; in other words, he has the power of throwing off the diseased tissues and building up new ones. The tree has not this power of recuperation, and of course you can never cure it. Small-pox of the man means sickness and, perhaps, though not necessarily, death; blight of the tree means death to all parts affected. The tree must have the affected part cut off. It is a disease that is and must be fatal. In a plant a genuine disease is always fatal. There is no such a thing as recovering in the sense that we recover from fevers. The only thing to do is to cut off the affected part. Now, that is the story made short. The disease when noticed is fatal as far as it has



gone, and the vegetable surgeon is the only man to call in. It is barely possible that it can be prevented, before making an appearance, by spraying; yet we have no proof that even this can be done. Back of the healthy wood is the infectious disease. It is infectious, and when once started must run its course. Cut out all infected parts whenever you see any blight, and always burn what is cut off.

WOLVERTON—If blight is injected into a tree will that tree start at once?

BESSEY—No, not always; blight is slow, but the final action is rapid. The actual disease is rather slow working through the tree, but when the final struggle comes it is quick enough. All twigs should be burned as soon as cut off; we are sure bacteria are dead when they are burnt. It is thought that these bacteria live and thrive in the soil. It is possible that this may not be so, but we cannot afford to risk it.

MARLATTE—Cannot this disease be carried by the wind.

BESSEY—Yes; it will pass through the air. We have no positive proof of this, but we know that a tree isolated from others will catch it.

GAGE—To show that it is contagious I have my orchard as a sample. I noticed that where the nursery was the trees are blighted worst. I have some blight in my orchard, and the farther away from the nursery the less blight there is. Nearer the nursery the blight is worse.

WOLVERTON—Concerning bacteria, I cut blight out of my orchard as soon as I noticed it. It took my pear trees and I cut it out. Had apple trees and cut off a little out of them. It took me two years to get it out of my apple trees. My neighbor had blight and he cut it off and hauled the dead limbs to his grove. Concerning the spread we find that it comes from the south and southwest—the direction of the prevailing winds.

HOGG—I am glad this came up. This is the first year I ever knew what blight is. My neighbors' trees are nearly all dead. Now I find it in my orchard of 3,000 or 4,000 trees. Have only twenty-five affected. I find in some of the trees only the points are affected, and in others it is on the sound limbs and none of the leaves dead. I would like to ask the professor what he would do in this case.

BESSEY—You will have to decide.

HOGG—You will find it in various forms. I am satisfied that it gives the borers a chance.

BESSEY—Blight on the twigs is easily told; but that on the limbs is hard to decide whether it is blight or sun-scald.

BELTZER—I think this is one of the most important questions we have.

BESSEY—I find it to be so.

J. L. BROWN—Now we talk a great deal about blight and what causes it, etc. I have seen this for many years; the trees affected one year would not be touched the next. It seems to me that trees on the wettest ground are worst affected.

BETSEY—While this question of plant diseases is up, I would like to ask about another plant disease that has come to my notice. Has black-rot made any progress in the state? Black-rot appears first as a brown discoloration of the grape; it gradually spreads over the whole berry and turns into a dry rot. Specimens I have seen appear to be genuine black-rot.

NEFF—I have had it in my Agawam grapes.

REED—For several years ours have been affected with some kind of a dry rot. The Lindley, Agawam, and some others seem to be troubled most.

BESSEY—Bordeaux mixture will save your vines; if you know that it is in your vineyard you can save 90 to 95 per cent of the fruit by spraying with this mixture.

DUNLAP—I find some vines with the leaves much affected; the Concord are turning black, some blue, having the appearance of being stung.

HOGG—A few years ago I had some vines affected, as the professor states. All the grapes rotted. From the little brown spot to the whole grape, the rot spread. Last year I had nothing of the kind.

BESSEY—The remedy is the Bordeaux mixture. Shower them with it before the grapes are fully grown.

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EVENING SESSION.

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HASTINGS, NEB., August 4, 1891, 8:30 P. M.

Called to order by President Taylor.

## BEST RASPBERRY AND RASPBERRY CULTURE.

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BY W. J. HESSER.

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OFFICERS AND MEMBERS OF THE NEBRASKA HORTICULTURAL SOCIETY: Once more you have me down for a paper on raspberry and its culture. I fear I shall not be able to present much that is new, and in a great measure shall repeat what I have said in former papers. For black raspberries I mainly grow Tyler, sometimes called Souhegan. Of this variety I grow five and one-half acres. I regard it as the best and most profitable. It is very hardy and very productive, the earliest to ripen. Season of picking lasts about four weeks; quality of fruit good; color, dark black; bears shipping well if not too ripe. I grow about two and one-half acres of the Gregg. This is a fine large berry, ten days later than the Tyler. After eight years' trial I should not recommend it for extensive cultivation as it is very liable to be injured by winter in this locality; otherwise I should grow it largely, for where it will stand the winter it must surely be very profitable. The berry is more solid than the Tyler and larger.

My raspberries are all planted in my apple orchard, which was set in 1873; raspberries planted in 1880 and 1883, then nearly all destroyed by hail on July 13, 1883, and reset in 1884 and 1885. Since then they have been the best and surest paying crop I have grown. Last year, 1890, extreme hot winds and continued drouth cut my crop short one-fourth or more and caused a very light growth of wood; so my crop this year is much the same in yield as last season, though the berries have been of very fine quality and size. On account of having many rainy days we had very large pickings on Monday, June 31, and July 6; had more berries than our regular customers could use, and so had to throw the surplus on the market through commis-

sion houses at low prices. The following table shows the number of quarts picked each day:

1891.

*Tyler Raspberries.*

June	22.....	100
	23.....	233
	25.....	120
	26.....	120
	27.....	256
	29.....	1,402
	30.....	306
July	1.....	216
	2.....	312
	3.....	394
	6.....	1,440
	8.....	194
	9.....	223
	10.....	84
	11.....	10
	13.....	312
	14.....	284
	15.....	80
	16.....	162
	17.....	130
		<hr/>
		6,378

*Turner Raspberries.*

July	3.....	14
	4.....	24
	8.....	18
	10.....	12
	13.....	24
	14.....	14
	15.....	65
	16.....	24
	17.....	12
	18.....	10
	25.....	12
		<hr/>
		229

*Gregg Raspberries.*

July 18.....	284
10.....	170
15.....	175
17.....	45
20.....	100
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	774

*Blackberries.*

July 17.....	43
18.....	64
20.....	108
21.....	360
22.....	156
23.....	84
24.....	355
25.....	48
27.....	648
28.....	264
29.....	252
30.....	223
31.....	242
Aug. 1.....	34
3.....	528
4.....	198
5.....	250
6.....	100
7.....	144
10.....	246
15.....	154
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	4,501

I will now give my way of cultivation. My apple trees are planted 20x20 feet apart. I plant raspberries in each apple tree row and one row between; making raspberries ten feet from row to row; plants are set two to two and one-half feet apart in the row, so when two years old they will make a solid matted row at top. This I regard as very important, as when planted further apart they are more

likely to be broken by the wind. When planted two to two and one-half feet apart they soon become a solid mat at top of row and support each other when well trimmed back. This we do by going through three times or more each season. Just as soon as the young vines get to two or two and one-half feet tall, I go through and pinch out the tips of the tender canes. This can easily be done with thumb and finger if attended to at the proper time. If not, a sharp knife or pruning shears are used. In five to eight days we go through again and pinch canes that were not tall enough at first, and so on until all have been pinched out. Where this pinching has been thoroughly done, the canes throw out three to five branches, on a stout main cane; the branches become so matted as to be almost impossible to be blown down by any ordinary wind, and the fruit the next year will be convenient to get at in picking. I practice clean cultivation. Plow and hoe just before picking season, and after picking I have all the old wood that bore this season's crop cut out and removed from the ground. Then plow and hoe clean. Later I layer tips where I want to propagate tips for planting or sale. The next spring, just after growth starts so I can see how much of the canes are good and strong, I cut off all dead ends of cane to where there is a good strong bud; this we usually do with pruning shears. This can be done speedily by one who can use his hands and eyes quickly.

## DISCUSSION.

HARRISON—We can raise blackberries in the west; certainly you can here at Hastings. For raspberries the Erie and Ohio do well.

DAY—Speaking of blackberries, Mr. McCormick, of Blair, estimates his crop at one thousand bushels. He has planted ten acres of Gregg raspberries this spring.

MARSHALL—I have had a little experience in this line; I find that when they get up about fifteen inches, then pinch them back. They are sure to live. From one and one-half acres I sold 1,812 quarts; sold 700 of them at home. Picked 1,100 quarts of blackberries and shall pick about 300 more. In the raspberries I have taken out all of the old canes. Have Tyler, Gregg, Ohio. The highest picking any one day was on raspberries—355 quarts. Am northeast of Lincoln about ten miles. My biggest picking in blackberries in one day was 300 quarts. Out of all that I have I have not had one quart to

spoil. I have noticed that north and northeast slopes are best. The difficulty with raspberries and blackberries this summer is heat.

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## CURRENTS AND GOOSEBERRIES.

BY W. F. JENKINS.

MR. PRESIDENT AND MEMBERS OF THE STATE HORTICULTURAL SOCIETY: Our secretary has assigned to me the subject of currents and gooseberries, best varieties and care and cultivation of the same. This is a subject in which I am very much interested, and trust that although this paper may not be very instructive it may be the cause of drawing out, through the discussion which will follow, information that will be beneficial to all of us.

Currents are one of the best, hardiest, and most productive fruits grown in northwestern Nebraska. But in order to obtain the best results we must know what varieties to plant, always remembering the fact that a variety of fruit may do well in one part of the state and be almost or quite worthless one hundred miles from that locality. When this is fully understood by the farmers and general planters throughout the central and northwest part of the state, then they will realize more fully than they do to-day the great necessity of selecting varieties suitable for the locality in which they are going to plant. The current and gooseberry are as easily grown as any fruit that is now grown in northwestern Nebraska; and the former finds a ready market in every city and village in the west; while the latter is not as desirable a fruit as the current, it is as easily grown, and should be planted on every farm and grown for home use, and to the extent that the local markets demand.

Deep and thorough cultivation should be the rule when preparing a piece of land for any variety of tree or fruits. In current and gooseberry culture this rule must be as closely followed as in growing almost any other varieties of fruit if we expect to obtain the best results.

I would plant two-year-old plants as early in the spring as the soil would do to work. Plant in rows eight feet apart and six feet in the rows, as the current and gooseberry do much better at that distance

than, closer together. I practice planting between rows of cherry trees as the currant and gooseberry do much better in partial shade. The cherry trees being twenty feet apart, we plant one row of currants or gooseberries between the rows of trees; then we plant a row of corn between the bushes and the trees, until the fruit needs all the ground. If currants are not pretty well protected by some wind-break the young growth will whip off very badly where they have been cultivated as they should be. A two-year-old plant will fruit some the next year after it is planted. The ground must be manured very heavily as often as every other year, and cultivated in with a double shovel.

The currant and gooseberry need no winter protection anywhere in Nebraska. Always try and manage so as to hold all the snow on the ground if possible. We never get too much moisture; very often we do not get enough.

Now as to varieties: I can only answer for those I have fruited. The Red Dutch I think is the currant for the farmer, the same as the Concord is his grape. Our experience with Fay's Prolific this season puts them far ahead of any other variety we have tested, although we have picked nine quarts of Red Dutch off one bush in June while they were green and sold them for ten cents per quart; the bush was six years old.

I give an extract from a reporter's account of a visit to the Arcadia Nursery:

"Fay's Prolific is a variety of currants that particularly attracted the attention of the reporter; this variety producing currants as large as ordinary cherries, and in an abundance that is surprising."

Fay's, as the name indicates, is very prolific; the fruit is very large and has a more pleasant flavor than the Red Dutch. The plant is not as good a grower as most other varieties; this is the principal reason why the Red Dutch is a better variety for the average planter. The

herry currant does well with us; and some think it is the best flavored currant we grow. The White Grape currant cannot be too highly recommended. It is a good grower after the plants are two or three years old; fruits young and very heavy; berries are large and very fine. The White Dutch does well, but we prefer the White Grape. We have grown the black currants, but I know nothing in their favor to recommend them to any one. I have dug up and thrown



away the last one I had. We grew the Houghton gooseberry about five years before we got any of the Downings. We have no use for the Houghton any longer. The Downing is a very large, fine, productive berry.

There are quite a number of varieties of small fruits that can be grown with great profit in northwest Nebraska; but I am confident that the currant can be grown with as much or more profit than any other small fruit we are growing in this part of the state.

#### DISCUSSION.

HARRIS—I commenced growing currants and gooseberries for home use, but I think they can be grown profitably for market. We have only a few rows of Downing and Houghton; from three rows seventeen rods long we picked 664 quarts of berries. We keep our bushes well cultivated. We cut out nearly all of the old wood. For the last three years they have borne nicely. For the last few years those who have taken pains with their currants and gooseberries have been getting good crops. Ours sold at eight and ten cents per quart, and at this rate, with good cultivation, they will be very profitable.

DUNLAP—I can tell something about the black currant. Probably Mr. Jenkins refers to the Black Naples; I will admit that it is not a very desirable fruit. However, we have a wild black currant that is good. After frost our native black currant has reddish leaves. I believe this is the parent of the Crandall currant. There is a yellow currant growing wild in northwestern Nebraska that I think is very good. I have some samples here which speak for themselves.

HARRISON—Regarding the propagation of currants, in about two weeks is the time to make cuttings. Nurserymen used to put out cuttings in the spring, but it is found much better to put them out from the latter part of August and the first part of September. Champion Washington, and Golden should be tested. Industry is too apt to mildew. The Fay's currant is a good one and bears remarkably well. I layer gooseberries and take up the layers. You can grow Downing gooseberries from cuttings; but the best way is to layer them.

REED—In regard to Fay's currant; it is not perfectly hardy; hard winters hurt it somewhat. It has long fruit stems, but not enough berries. Victoria is the best we have; four times as many berries as

the Fay's. Downing never fails us. I have Downings that have borne every year for eight years.

MARLATTE—I wish to inquire about the Houghton and Downing gooseberries: I have a lot that were sold as Downing Thornless; they have very few thorns. Have a gooseberry that is known as the Houghton; it has thorns. What is the difference between the two varieties? We prefer the pale red thornless gooseberry.

REED—The Downing gooseberry is much larger than the Houghton; it is of a pale green color when ripe; the bushes are nearly thornless. The Houghton is a small berry, nearly red when ripe. The Victoria, Red Dutch, and White Dutch currants are all about the same. Leaves set on them well. Fay's and Long Bunch Holland hold their leaves a long time. The Victoria's habits are similar to the Red Dutch.

LAING—I have some very fine gooseberries that were imported from England; some of the berries are one and one-half inches in diameter. One great trouble I have is the moles; they seem to delight in cutting off the roots of my fine gooseberries. What can I do to kill them? I have tried castor beans, but they do no good. We like the Smith's Improved much better than the Downing.

HARRIS—Put strychnine into pumpkin seeds and place them in the holes where the moles run; this will kill them.

HARTLEY—I wish to express one thought in regard to gooseberry growing: I had this year an average of one gallon per bush. They were planted 5x5, or 1,750 per acre; we received twenty-five cents per gallon—this would be a small price in Lincoln—or ten cents per quart. Now, at this rate we expect twenty-five cents per bush from each of the 1,750 bushes on an acre—or \$437 from that amount of land. Of course the gooseberry market is local, but on general principles it would not be amiss to plant out quite freely of this fruit. It will pay.

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## THE INFLUENCE OF HORTICULTURE.

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BY C. L. INGERSOLL, NEBRASKA STATE UNIVERSITY.

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Friends, we greet you! This is no ordinary occasion, and the interests involved are those of great moment, not only to those who are present and share with us in the benefits of this meeting, but to those

who are absent, and who can and will profit by the deliberations of the hour in years which are to come. It is one of the important signs of the times that men are becoming more interested in advanced work in agriculture and in the advantages in which science, coupled with practical experience, may give to it.

In this particular branch, horticulture, more interest attaches, especially when we plant trees or shrubs for the fruit of which we must patiently wait for periods of from three to ten years. With what care must one perform the work and what anxious painstaking must be given to the work of our hands in way of preservation and cultivation in order that we may reap the results of our toil? No careless one need attempt the work. No one who has not a good degree of persistence should begin, for otherwise failure will be stamped everywhere.

A friend of mine says, "There is no use in my trying to be a horticulturist. The things won't grow for me." Well, here are some of his signs about his place: His horses are always poor; his cattle appear as if they had just attended a funeral; his gates are off the hinges; the fences down in places; the crops look patchy and forlorn; even the children share in the same general feeling and appearance. No wonder fruits do not thrive. A fruit tree knows when you approach it with a smile or a caress almost as well as your favorite horse or cow. You show interest in it, and that interest must be continuous; it will not do to be spasmodic about your care, your pruning and the like. Here is a man who neglects his orchards for three to five years and suddenly wakes up to the fact that something must be done. He takes his men and goes to work to mutilate his trees in such a way that the orchard does not recover from it for the next five years. He then congratulates himself on having discharged his accumulated duty of recent years in a short time and relapses into the quiet of his previous life.

But let us notice the value of horticulture to us as one means of influencing us; for whenever we speak of values or income the American people are generally wide awake. Horticulture is of value to the public, to the horticulturist, and to the state.

The people are benefited by the large array of fruits placed upon the markets at such prices as practically to be within the reach of all. And there are two things which aid in a continuation of this for the entire year. The rapid transportation from south to north by which the

early products and those not indigenous to our country may be quickly and cheaply placed at our doors, and the processes of canning and preserving fruits which produce stocks of many varieties to keep up the supply. With these aids the horticulturists need not fear and the consumers can be sure of a wholesome supply for every day in the year.

The sanitary effect is not to be missed in passing; for those persons who live quite largely upon fruits, other conditions being equal are the most healthy and long lived.

To the raiser of fruit, if industry and honesty rule and care be taken, there is a good reward. Small areas well tilled often give greater net results than a three hundred acre farm managed in the ordinary way. But, says one, you just mentioned the fact that fruits were greatly reduced in price by production so that all might purchase. Yes; enlarging the market, do you see, so that when these people have acquired a taste for fruit it becomes a necessity on the table and we have regular customers at somewhat lower rates but they are regular buyers, which fact gives ready market. Quick sales and small profits with plenty of them, make the result as a whole profitable to the growers. As the market quickens and the prices rise he is induced to plant more trees and to care for those already grown and producing in a better manner. Then, perchance, he may join the State Horticultural Society and cast his influence in furtherance of the great cause.

To the state all such persons are public benefactors, for do we not add new and diversified products to the list already cultivated? And is not our commonwealth enriched in many ways thereby? It is wonderful what an influence one good horticulturist will have in every community. His example is worth thousands of dollars; his faith is inspiring and his successes lasting, while his occasional failures are forgotten in the general praise for good accomplished.

But what about the ethical influence in this princely occupation? It is a common expression that "through nature we look up to nature's God." But no man comes so thoroughly in contact with nature as the one who plants trees and has a nice garden of fruits, vegetables, and flowers. These last are sure to come as one's soul opens out to the beauties of nature and when the outer crust of sordidness has become softened and broken.

We need to be taught that many things are of value even if they will not sell for cash. Who can tell the refining influence of flowers

in the garden, flowers in the windows and on the tables? They cannot help entering into and forming a part of our lives, softening our natures, lifting us up to a higher plane of thought and action. Yes, the influence of flowers is great, it is felt at all times and places. Says Wordsworth:

The meanest flower that blooms can give.  
Thoughts that often are too deep for tears.

Flowers! bright emblems of immortality! How they smooth the pathway of our friends to the tomb and soothe our hearts in the giving! How they enhance the beauty and joy of the would-be bride, as she is about to step under the floral bell! What banquet would be complete without them to feast the eye while the taste is being satiated and the soul filled with joy at pleasant association!

But I pass from this pleasant part of my theme to consider one more point, which is, that horticulture is an occupation which appeals to the intelligence of a community. Go where you will, a convention of horticulturists will compare favorably with any body of men in intelligence and education. We will not even except the average political convention, where is supposed to be congregated the most of the wealth, wit, and wisdom of the land. But, seriously, there are reasons why this is so. In the first place they must be reading and thinking men and women. The things with which they have to do call into action the higher and better energies of the individual. He must study the fungi; the noxious insect whose name is legion, the climatic conditions, the particular wants of each species with which he has to deal, and this educates him, makes him more intelligent and successful. You may say that the ordinary farmer meets with the same problems and has the same incentives to become intelligent. There is, however, a difference in degree. A man can succeed fairly well in a routine life at farming, but not in horticulture. It calls for a higher, nobler element in our nature and characteristic life and energy.

In closing, let me urge upon all not to forget all the influences which surround us as horticulturists, and emanate from us as an association. Let us remember that they are valuable from a monetary standpoint, the ethical, and that of intelligence. Then if it be good to be associated together, let each member become a missionary to induce some neighbor or friend to plant and gather and be joined to those

who are associated in this grand work, adding some wealth to themselves but vastly more to our beloved state.

## DISCUSSION.

HARRISON—The horticulturist is the high priest of nature. His art draws him nearer to nature's heart than any other. It seems to me that a man is exalted by horticulture. I have seen a pair—man and wife—who blasphemed God; they cursed their fate, the country, and their neighbors. I thought, they have no trees around their home; and so it was. They lived in a bare looking house—more like a barn—with not a tree or flower near. They were lean and cadaverous looking—veritable “hat-racks.” The man was one of those croakers who say, “You can't raise fruit here.” They are good specimens of the negative man and woman. There are five hundred shrubs and flowers that thrive in Nebraska. The positive man takes advantage of this and makes his home a paradise. The one says God picked this country a little too green, and the other says that it is all right.

## ANNUAL MEETING.

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### AFTERNOON SESSION.

LINCOLN, NEB., January 12, 1892.

**PRESIDENT TAYLOR**—The house will please come to order. At this time it is our usual custom to take in the fees for membership; it should be stated that the fee for annual membership is one dollar, and five dollars for life membership. I do not think it is necessary to read the minutes of last meeting, as they are now printed in the 1891 report.

**STEPHENS**—It was formerly our custom to have the officers elect take their places immediately after their election; but at our last winter meeting we saw that this causes some conflict, especially if the officers be not re-elected. In order to avoid this we made some changes in the by-laws, which have not been properly entered upon the minutes. These changes were: That all officers, except the Secretary, should hold their offices until the close of the annual winter meeting; and that the Secretary should hold his office until June first, following the winter meeting. I move you, Mr. President, that the minutes be corrected to read that way.

**DAY**—(Reads by-laws as corrected.)

**PRESIDENT**—The point is that all officers, except the Secretary, shall hold over until the end of the winter meeting. The motion is that the minutes be corrected.

**CARPENTER**—There would be some difficulty with the Treasurer: he has to file a bond which is to be accepted by the Society; he might experience some difficulty in getting bondsmen at the last day.

**BARNARD**—I think that would make some conflict. We have to make settlement with our officers before they are released, and this would be rather awkward on the last day.

**PRESIDENT**—The question is on correcting the minutes. I do not see that it would make any conflict.

**MASTERS**—There is another item in that change that did not seem

to me to be best, that is in regard to the Standing Committees; it seems to me that the incoming President should choose his committees.

PRESIDENT—The minutes appear to be wrong. They should read: "All officers, except the Secretary, shall hold until the end of session of winter meeting." Those who favor making the correction may say "aye." Carried.

STEPHENS—Mr. President, I move you that we proceed with the regular programme. Carried.

#### REPORTS OF STANDING COMMITTEES.

##### *Necrology.*

CARPENTER—There was one of our members who has died since our last meeting, but I was not much acquainted with him. Do not know whether he was a horticulturist or not. Will report later.

##### *Geology.*

PROF. L. E. HICKS—I have no report except my paper, which will be read later.

##### *Forestry.*

STEPHENS—Concerning the subject of forestry, I have been confident for some time that it is a subject of vast importance to the people of the United States in general and the state of Nebraska in particular. For a number of years I have been engaged in the practical work of setting out forest trees on timber claims in western Nebraska, Kansas, and eastern Colorado. For several years there have been immense numbers of forest trees planted on timber claims in the states named, and there will be many more yet planted. I am sorry to say, however, that not more than one-third as many will be planted in the future in the same space of time, for the reason that the United States timber culture laws have been repealed. Although the amount that will be planted in the future will not be so great as formerly, yet there will be far more than many people suppose. Many who were waiting for a chance to sell out, and who planted a few seeds in order to comply with the letter (not the spirit) of the law, will now have to get down to business and get their trees to growing. All must recognize that it is far cheaper in the end to plant good, healthy trees than seeds; and for this reason the forest tree trade will be good for some



years yet. I am sorry this law was repealed; it is true that a good many people tried to evade it by seeming to comply with it; but the intent of the act was good, and it was just beginning to be a blessing to the treeless plains when it was repealed. Many who thought formerly that our orchards need protection, now argue that they need air more than wind-breaks; that no wind-break is needed except on the north and northwest. However true that may be, it is certain that the repeal of the timber claim law will cut down the planting of forest trees many millions during the next ten years, unless some other method be taken to encourage people to plant.

### *Legislation.*

STEPHENS—The various members got to Lincoln, and used such influence as they had, together with the influence of all the friends they could get interested in our work. We think all people will see the importance in having our state well represented at the World's Fair in Chicago in 1893. There has been handed to me by Mr. Carpenter a paper which might properly be brought up here.

CARPENTER—Many people who have never visited California have no idea how disgusting are the insect pests of that country. I visited many orchards in California, and all of them were affected by the San José scale. I move that we adopt this report by our Society, and place it in the hands of our Legislative Committee for use in their business.

### *Report of Committee on Awards.*

BARNARD—I move the adoption of the report, and the discharge of the committee. Carried.

### *Revision of Fruit List.*

BARNARD—I move that the fruit list be left as it is for the coming year.

YOUNGERS—I move to amend by adding the apples exhibited by Mr. Masters (York Imperial, Kitagiska, Rochester Pippin, and Campbell) the same to be placed upon the trial list. Amendment carried.

JENKINS—I would like to amend by placing Missouri Pippin on the recommended list for the West-Central District. Amendment carried. Motion carried.

## PRESIDENT'S ADDRESS.

PRESIDENT—During the year I have received a good many suggestions from different members of the Society, and I have filed them away in an envelope. These I have arranged as logically as possible and present them to you for your consideration.

During the past year a large number of questions have come up which I have carried over until this time and which I wish now to report upon. It seems to me that there has never been a fair adjustment in our premium list of the proportionate amount of money which should be paid to the florists in the different departments of their display, and it seems to me that this matter, together with the matter of giving our premium list—as well as rules and regulations—a complete overhauling, should be given into the hands of the committee of three or five, or should be left in the hands of the incoming president, secretary, and treasurer for careful preparation, with power to prepare a new list and act finally upon it. There are at present in our list of premiums a number which should, in my opinion, be stricken out altogether, and there should be a general overhauling and readjustment of the amounts paid. I can see no good reason why there should be any premium paid upon displays of nursery stock, and would suggest that all such premiums be stricken out, and that instead a diploma be granted. There should also be diplomas of a neat design printed so that in this, as in many other cases, there could be something for the exhibitor to show for having made his exhibit, where it is not desirable to pay money.

It is absolutely necessary that there be a new building constructed on the fair grounds in which to show the flower and plant exhibit. I think the Agricultural Society will build us such a building if the case is presented to them, and it seems to me that a committee to confer with them should be appointed at this meeting, who should have it for their duty to prepare designs showing the sort of building we need, and to give statistics as to the number of entries we have in this department, and to, in a general way, have charge of presenting the facts to the Society.

I attach hereto a communication from the Douglas County Horticultural Society in regard to the floral exhibit and would recommend that it be handed to the committee which I have first mentioned, should such a committee be appointed, for their consideration.

I also received a letter dated December 16, from Hon. J. M. Samuels, chief of the Department of Horticulture for the Columbian Commission, in which he asks us as to what we wish in the way of space at the exposition; I answered that the matter would be taken up by our Society at this meeting, and asked him in the meantime to hold us some good space so that we could have a chance to make a good exhibition if the Society so desired. Immediate action should be taken in this.

There should also, it seems to me, be a man recommended to the chairman of the State Commission upon the Exposition as superintendent of the horticultural exhibit for Nebraska at the Exposition. Either this superintendent or some one else should be authorized to go to Chicago, or to confer with our Commissioners, so that they would see that definite and adequate arrangements are made as to space before it is too late.

At the State Fair there has always been complaint that our rules and regulations were not sufficiently understood, or that they are changed every year so that exhibitors of one year do not know whether the former year's rules will apply or not. It seems to me that there should be printed on the back of our entry blanks the rules and regulations, so that exhibitors would have no cause for complaint on that line.

Before another fair our Society should buy at least 2,000 additional plates for use at the exhibit. I have corresponded some in regard to prices, and I attach the correspondence hereto.

At the last Fair I took upon myself the responsibility of departing from the old time custom of having three judges in each department, and instead, had one judge do all the work of going over the fruit, another to do all the cut flower judging, and another all in the plant department. I wish to strongly recommend that this be made a regular thing, and that hereafter only one judge be appointed for each department. By paying probably twice what we have been in the habit of paying to each of the three judges we can get men of undoubted ability, and whose authority on such matters will not be questioned; in addition to this, the work is done in about one-half the time, and so far as my observation goes, the exhibitors have uniformly been better pleased.

I have felt for a good while that we are wasting good money and

getting poor work done at the State Fair by having three judges. Last fall I took the responsibility upon myself of hiring one good judge and dispensing with the old system of three. There has always been a great deal of complaint under the old system; but last fall I do not think there was one person who came with a well-founded complaint. Where there are three judges one man usually does the work and the other two "jangle." Where there is but one, he can apply himself and get it done properly. Besides it will save some money to the Society.

#### RECOMMENDATIONS ON PRESIDENT'S ADDRESS.

First—We recommend that the premiums on nursery stock be stricken out and diplomas awarded.

Second—That a committee of three be appointed to confer with the State Board of Agriculture in reference to a suitable building for the floral display at the coming State Fair.

Third—That the rules and regulations on exhibits be printed on the back of all entry blanks.

Fourth—That 1,000 plates be purchased, with the name of the Society printed thereon.

Fifth—That one expert judge be employed to judge exhibits in each department.

PETER YOUNGERS, JR.,  
*Chairman of Committee.*

Amended and accepted.

YOUNGERS—I move to refer the President's address, or suggestions, to a committee of five, and have them report at the time of the revision of the premium list, to-morrow evening. Carried.

CARPENTER—I think in making up that report the committee ought to take into consideration the unprotected condition of the fruit tables. There ought to be a railing put around them. There are many specimens stolen from them every year.

PRESIDENT—Any changes we think advisable should be brought up now.

GOODRICH—I would suggest that the premiums offered be regulated by the fruit list as recommended by the Society. In one way we encourage the growth of certain varieties by placing them on the fruit list; and in another, we discourage them by giving them no premium for them.

BARNARD—If we have not passed general business, Mr. President, I move you that the By-Laws be so changed that of the incoming officers the President be allowed to choose his committees, and the Treasurer to read his report before the close of the winter meeting.

CARPENTER—The Treasurer's report is read before our Society, is accepted by us, and his bondsmen are released. The way the By-Laws are now it leaves the bondsmen in a peculiar condition, supposing the new Treasurer cannot get bonds.

YOUNGERS—I think that can be arranged all satisfactorily; the present incumbent can turn over all the papers he holds to the incoming Treasurer, and he can make the report.

STEPHENS—I would like to ask the Treasurer how much bonds he gives. (\$12,000.) Well, if a man is elected who does not accept, or who cannot give bonds, it seems to me that it is just as easy to let the old Treasurer hold over.

By-Laws amended. Carried.

Committee on President's Suggestions and Revision of Premium List—Peter Youngers, Jr., E. E. Stephens, L. E. Chapin, W. J. Hesser.

BARNARD—Mr. President, I move that we proceed with the programme.

## IRRIGATION AND HORTICULTURE.

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BY PROF. L. E. HICKS.

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Divide the United States in half by a north-south line, and on the east side of that line you will find an annual rainfall sufficient for agriculture without artificial irrigation; on the west side of the central line you will find the rainfall uncertain and frequently insufficient in a broad belt known as the sub-humid, adjacent to the rain-belt, while, stretching away westward from the sub-humid belt, the vast arid region extends to the Pacific ocean. At present the rain belt contains the great bulk of our population, and produces the great bulk of food products for home consumption and exportation. The fertile lands of the rain belt were first occupied, because they required neither capital nor skill to utilize them. But since the rapid growth of population has begun to crowd upon the means of subsistence, and attention has been turned to irrigation as a means of utiliz-

ing large areas of hitherto unproductive and almost desert lands, the arid region is being rapidly converted into the irrigation empire. States which once relied wholly upon their mineral wealth are suddenly awakening to the fact that the soil and water are worth more than mines. Agriculture and horticulture are of greater importance to-day to Colorado and California than gold and silver—more important in actual values annually produced, measured in dollars and cents; but in respect to their permanent influences upon the people the value of the peaceful and settled industries is immeasurably greater. The mining camp is low in the scale of civilization; so is the cattle ranch. It was once thought that the arid region must be given over bodily and forever to mining camps and cattle ranches. Irrigation has changed all this and evolved a higher civilization. Churches, schools, cosy homes, and gardens wherein the tateful and refining influence of woman is seen, have supplanted the savage squalor of camp and ranch. At least the transformation has begun; its greatest triumphs and happiest results are yet in the future.

In this progressive and felicitous transformation of half a continent, two things go hand in hand as agencies for producing the higher civilization, and at the same time as indices of its advancement. These are irrigation and horticulture. I have linked them together in the title of this paper, but not by violence. They belong together by divine ordinance. Gardens and orchards made green and blooming and fruitful by irrigation, are the main props of the irrigation empire, as well as its choicest ornaments. Within that empire they are the main pillars in the grand and beautiful temple of the higher civilization. The human race began its existence in an irrigated garden. "And a river went out of Eden to water the garden." Gen. 2: 10. Since the fall, mankind has pursued devious and degenerate courses in the rain belt, scratching over the surface of hundreds of acres for a few bushels of grain among the weeds. Now we are gradually getting back to irrigation and horticulture as they were practiced in Paradise, a few acres yielding not only food for a family, with light, healthful, and agreeable occupation for all its members, young and old of both sexes, but also a surplus for the market. Home comforts, social pleasures, intellectual and spiritual enjoyments, take the place of the solitary and savage existence of the owner of "all the land in sight."

Irrigation and horticulture belong together, because both are ex-

amples of intensive culture. Both demand considerable outlays, and yield correspondingly large returns per acre. The first impulse of the old fashioned rain belt farmer is to shun everything that costs money, no matter how much ultimate profit may lie in the investment. The first impulse of the wide-awake citizen of the irrigation empire is to spend money on his land; spend it for water, spend it for fertilizers, spend it for improved varieties, spend it in deep and thorough tillage. The only proviso that he keeps in mind is that if outlay is large the profits shall always be larger. So long as any satisfactory ratio of profits to capital and labor expended is maintained, so long the absolute cost per acre of the improvements is a matter of no consequence. Figures which would paralyze the farmers of the rain belt are viewed with complacency, for behind them the horticulturist who irrigates sees still larger figures representing his profits. Let the running expenses be large; the profits are enormous. In fact the more concentrated the values become, and the greater the returns from a small area, the better it is for the owner in every respect as well as for the community of which he is a part. It means better homes, better neighbors and more of them, better schools and churches, better roads, a higher tone in social life, and more of the conveniences of the city in the midst of the freedom and healthfulness of the country. In Fresno county, California, the average holding per family is thirty-one acres. A colony of 500 persons settled there in 1871 and laid out 5,000 acres in vineyards. This has become the most prosperous colony in the state, excepting only Riverside. In 1890 they numbered 100,000, and included a city of 25,000 inhabitants. Their lands have risen in value from \$2.50 per acre to \$300 per acre. In 1890 they shipped nearly a million boxes of raisins. At Riverside the holdings are still smaller. Ten acres in oranges is a fortune. The urbane features of this colony are still more pronounced. The whole country for miles along the river has all the conveniences of prosperous city life.

The cost of water in the arid region inevitably tends to crowd out general agriculture and to substitute therefor the two chief forms of horticulture—fruit raising and market gardening. The conditions in respect to nearness of market and good prices must be highly favorable in order to make ordinary field crops profitable on land supplied with water at such rates as are often exacted by the canal companies.

At any rate, horticulture pays so much better that all lands suitable for orchards and gardens is rapidly occupied. California began its existence as a mining state. It took a long step toward civilization when it became a wheat state. But its next step was a still more important one in its civilizing and humanizing influences, when it became a fruit state. Other states of the arid region are following in the wake of California with equally happy results in respect to the character of the people. But does it pay? That is not the most important question of course. If a given industrial system makes the people happier and better, that is reason enough for its adoption. But after all, human nature being as it is, the practical index of success and continued vitality of any system is to be found in its pecuniary results. Let us look at it then in the light of dollars and cents. There is, unfortunately, no way to get at the exact net profits of horticulture in the arid region, unless we are content to accept the isolated cases reported in the advertisements of land companies, and in "boom" editions of western newspapers. It is justly feared that these may not always be strictly accurate. But a fairly reliable index of the profits of horticulture is the average price paid in *bona fide* sales of land for horticultural purposes. If a man will pay \$1,500 per acre for orange land he must be convinced that he can get a clear profit of \$150 per annum out of each acre, or else he is content with less than ten per cent interest on his money.

In Arizona irrigated lands devoted to general agriculture are worth from \$10 to \$50 and fruit lands from \$75 to \$150 per acre. In California farm lands vary from \$35 to \$50 and fruit lands from \$300 to \$1,500 per acre. Large areas formerly devoted to wheat, with an average profit of \$7.50 per acre, are now devoted to fruits, with profits ten, twenty, and even, in some cases, forty fold greater. "The average net returns per acre of wine and raising grapes, prunes, and deciduous fruits generally, when they are in a matured state, will range from \$80 to \$200 per acre. The average net returns for matured orange and lemon orchards will not be less than \$350 per acre when all conditions are fair."

In eastern Colorado, where the conditions are nearly identical with those of western Nebraska, non-irrigated land ranges from \$2 to \$30, irrigated farm land from \$100 to \$130, and irrigated fruit land from \$200 to \$500 per acre. These facts, and they might be multiplied in-



definitely, are quoted from Hinton's Progress Report, Part I, United States Department of Agriculture, 1891. They show that irrigation and horticulture are securely linked together by the bond of large profits.

This may all be true, says one, for semi-tropical or otherwise specially favored localities, but has it any meaning for Nebraska? Certainly it has. In eastern Colorado horticulture is a demonstrated success by the aid of irrigation, but without irrigation a dismal failure. In western Nebraska also, fruits and garden vegetables have been produced with marked success and profit wherever the aid of irrigation has been invoked. At Culbertson, Ogalalla, North Platte, Sidney, Minatare, and Gering the value and effectiveness of irrigation in making horticulture possible and profitable have been practically demonstrated. From half an acre of land irrigated by a windmill pumping water from a well, one man at Ogalalla, in 1889, produced vegetables and small fruit for his family, and sold \$125 worth to his neighbors. At North Platte a young clerk in 1889 planted in cabbages two acres of land irrigated by percolation from the main ditch, and sold the crop in the field at \$500 per acre. Since the water cost him nothing his only outlay was for seed, planting, and cultivation, so that his \$1,000 was almost clear profit. At Fort Sidney the garrison has been supplied for many years with vegetables and fruits produced on a small tract irrigated from the oldest canal in Nebraska. I learned of a man by the name of Fairfield at Minatare, Scott's Bluff county, this state, who had been so successful with irrigation that I wrote to him for his views on the subject. His letter is so full of facts that I have made a copy of it and incorporated it into this paper. I will read it:

"MINATARE, NEB., Jan. 7, 1892.

"*Mr. L. E. Hicks*—DEAR SIR: Yours of recent date in regard to small fruits and vegetables grown under irrigation in Scott's Bluff county, Nebraska, duly received. I will say that I have made a perfect success after learning just how to manage the business, when and how to irrigate, and to stop when you have enough water; for there is as much danger of getting too much water as not enough.

"To begin with the potato: The ground should be plowed from eighteen to twenty inches deep, harrowed well, furrowed about four inches deep, and planted in rows one way, hills two and one-half feet apart

in the rows. Prepare the land in the forenoon and plant in the afternoon. Roll down with heavy roller; by so doing you husband all the moisture in the ground. After the ground becomes dry to the depth of three or four inches, run between the rows with a single shovel plow, or a lateral plow made for the purpose, hilling up the vines. Then turn the water on, but not enough to flood the vines. Allow the water to soak the ground thoroughly. This generally takes about three or four hours. Then shut off the water. After three days go between the rows and stir the ground. As a general rule, after one thorough watering and two cultivations the potato crop is laid by. The yield and the quality of the tubers are far superior to those grown under rainfall. The water must not come in contact with the vines. If it does the potato will be watery and scabby, and will rot.

"Onions, beets, turnips, parsnips, etc., require deep plowing and considerable water, except beets, which would better want a little water than get too much. All may be flooded, but I prefer the lateral method, and regard it as far superior. A thorough cultivation should be given as soon as the surface of the ground becomes dry after each watering. I shipped a barrel of onions down to Cass county last fall, Southampton, Yellow Globe, Danvers. Some were placed on a show board with onions shipped in from California, and they were fully equal to them.

"Cabbage, celery, cauliflower, tomatoes, kohl-rabi, egg plant, spinach, in fact everything of this class, I can safely say that I have grown with the most perfect success. When I wish to transplant my cabbage, tomatoes, celery, cauliflower, etc., I prepare my ground in good shape, put out my plants, turn on the water, flood the whole patch, and let it stand on the ground about ten hours. In forty-eight hours your plants will stand as erect as though they had never been disturbed. Quite large plants can be used. Cabbage, cauliflower, and celery require more water than any other vegetables which I have tried to raise.

"My success with the sweet potato has been all that could be asked, but I don't think that irrigation does it all; cultivation must not be neglected. I start the plants in a hot-bed. After transplanting, the ground must be kept loose and moderately damp. My test for the need of watering is this: Remove two inches of earth from the surface

of the ground, take up a handful of earth from the spot where you have removed the surface and squeeze it tightly in your hand. If it holds together no water is needed; if it crumbles then apply the water.

"With what experience I have had I prefer irrigation to the natural rainfall for all kinds of garden, field, and vineyard products; but, like everything else, it has to be understood, and in order to understand it you must experiment, study, and closely observe the results of your labor if you desire to make a success of the business.

#### "SMALL FRUITS.

"I have about one-fourth of an acre of raspberries. I have been accustomed to seeing them all my life, and in no country have I ever seen them more prolific, bushes finer, berries larger, sweeter, or better flavored than we raise here. But they take lots of water. They require irrigation once a week during the fruiting season, and this should be continued till the fruit is all ripened and gone. Then you have no little dwarfish berries; the last of the crop is as large and fine as the first picking.

"My currants, gooseberries, quinces, grapes, etc., all flourish here remarkably well. The strawberry could do no better anywhere than it has done for me right here. They should be watered twice a week from the time the flower drops its petals until the berry is ripe and ready to pick for the market. Continue this watering twice a week all through the fruiting season. If possible, flood strawberries at night while fruiting, otherwise the sun will scald them. Let the water stand on them about two hours at each watering. Then you have berries from one to one and a half inches in diameter, perfect in form, solid, sweet, and lots of them. I have a plat 90x22 feet ( $\frac{1}{2}$  of an acre) set to Sharpless, Wilson, Crescent Seedling, and Cumberland. On the second year after setting out the bed we picked and sold 284 quarts at Gering, 140 quarts on the place, and used ourselves 108 quarts, making in all 532 quarts. They sold readily at 25 cents per quart. We could have sold more if we had more to spare, but realized the snug little sum of \$133.

"I think mine is the only small fruit garden in the western tier of counties in Nebraska. But it is useless to try to grow anything, fruits, trees, vegetables, or grain, without irrigation. You may once in a while grow about half a crop of grain, if perchance you get an extra

amount of rain. But with plenty of water, and a thorough and judicious application of it, anything that can be grown in this latitude east of us can be raised here. I have tried a little of almost everything that is grown in this latitude, and in no instance have had a failure. Visitors come here from Sidney, Alliance, Kimball, and many other places, to see my 'experiments.' We have a flower bed 600 feet long that is the center of attraction. There are over 200 varieties. I must not prolong this letter, but can't resist mentioning the Phlox Drummondii. Every color is there combined. Their dazzling brilliancy almost blinds one at noon-day. They begin blooming in May and continue until hard freezing weather comes on; a slight frost don't affect them. It would be difficult to describe the elegance of our dahlias raised from seed. Nothing could be finer than our dwarf hollyhocks. We have about thirty varieties of roses.

"Many of our visitors, after passing through the arid plains, upon reaching my place exclaim, 'Can it be possible that all this change can be wrought by irrigation?' My reply is, 'Yes, ladies and gentlemen, you can see for yourselves. Come back in two years and you will see apples, cherries, plums, apricots, and pears, in addition to what you now see; for here are the trees now growing and looking as vigorous as any one could wish.'

I have tried as hard as any one could try for two years to raise something out of Mother Earth without irrigation, but never succeeded in getting enough for one good square meal. If you should now inquire whether irrigation is a success in Scott's Bluff county, our fields of waving grain, our blooming gardens, our well filled granaries, corn-cribs, and cellars, will echo back the answer, "See for yourselves what irrigation has done for the poor homesteader!"

"Very respectfully,

GEORGE W. FAIRFIELD.

"Minatare, Scott's Bluff Co., Nebr."

In every particular, except a slightly lower altitude, and a slightly greater rainfall, western Nebraska is similar to eastern Colorado, where the success of horticulture is no longer a theory but a fact. In soil, climate, winds, moisture, temperature and sunshine, the two regions are practical identical, and the exceptions, the slight differences in altitude and rainfall, are in favor of Nebraska. For twenty years, ever since the planting of the Greeley colony in 1870, gardens and orchards have flourished in eastern Colorado. They are twenty

years ahead of us, not because they were naturally better off, but because they were worse off at the start. They could do nothing without water. They had to irrigate, and by irrigation they have outstripped us, who dallied with the alleged natural rainfall, and fell behind in the race.

A. E. Gibson, a very successful horticulturist of Greeley, Colorado, and author of an excellent little manual, entitled "Horticulture by Irrigation," Republican Publishing Company, Denver, Colorado, says in the preface of that work: "That Colorado and adjoining territory are destined to become large producers of the horticultural staples, there seems little doubt. The wide diversities of soil, climate, and variations of altitude, the dryness of the air and almost perpetual sunshine from the skies, together with reasonable assurance of an ample water supply, all combine to make success possible in many directions. Hence there is scope and hope for much that must necessarily be denied to other portions of our land that do not possess these natural advantages and distinctive conditions."

And R. J. Hinton says: "Colorado is now one of, if not the chief of apple-growing states of the Union."

The similarity of western Nebraska to eastern Colorado is an undisputed fact. It could not be otherwise than similar, considering its immediate contiguity. Wherein it fails of exact resemblance in altitude and rainfall, it by so much excels Colorado. Hence every demonstration of successful horticulture by irrigation in Colorado, and there are hundreds of such demonstrations in this little book of Gibson's, applies equally to Nebraska.

These facts have also an important meaning for the whole of Nebraska. I have spoken of the western part of this state hitherto because of its contiguity and similarity to Colorado, where the possibilities and profits of horticulture have been amply demonstrated. But I mean more than western Nebraska. I mean central Nebraska; I mean eastern Nebraska; I mean you, right here in this Society. I make bold to say that the coming man in horticulture will irrigate. By irrigating he will double his product in quantity and improve it in quality, provided of course that he uses water judiciously. The indiscriminate and careless use of water is ruinous to the quality of horticultural products. The vigorous productive life of a vineyard or orchard will be greatly prolonged by judicious irrigation. Winter-

killing, which is due to lack of moisture rather than low temperature, may be remedied by liberal irrigation in autumn, after growth has ceased. Before the completion of the season's growth water must be sparingly applied, or else more wood will form than can be matured in time for the approach of winter. Best of all when drouth consumes your gardens, your vines, and your trees, as it will do every half dozen years, the irrigating horticulturist will go about chuckling and jingling the coins with which his pockets are bursting, because his crop is better than ever, and brings fancy prices, for the very reason that yours has failed.

Hence I say that the coming horticulturist will irrigate, not only in western Nebraska, but in eastern Nebraska, in Iowa, in Illinois, and on to the Atlantic coast. In fact the Atlantic coast is not going to wait for the irrigation empire to come on from the west. They are already irrigating fruits and market gardens on a large scale for the supply of the great cities. We are accustomed to think of the water of irrigation simply as so much moisture. But it is in fact, a first class fertilizer also, by virtue of the matters dissolved or held in suspension in it. And now, in addition to these uses, the horticulturists of the east have found still another. They use water to force an early growth, so that they may command the prime of the market. The water is heated and conveyed underground to the roots of the plants, making a hot-bed of the whole garden, and producing astonishingly early and strong growths, for which the prices realized are as luscious as the products.

Sub-irrigation, by the way, is the ideal method in horticulture. The first cost of subterranean pipes is, of course, much greater than the simple furrows which would convey the water on the surface. But the economy of water, the ease and convenience of its application, and the possibility of heating it in the pipes for the purpose of forcing an early and rapid growth, more than balance the account.

If I have not hitherto said much about irrigation in eastern Nebraska it was only because of the hardness of your hearts, which would not endure sound doctrine. In western Nebraska the gospel of irrigation, which once encountered only sneers and abuse there, as well as here, now has before it an open door, a hearty welcome, and all the people say amen. I do not say that exactly the same change will occur here. For general agriculture, unless the price of food

should advance far beyond our reasonable expectations, irrigation will not pay here for a long time yet, if it ever does. But for fruits and gardens it will pay now. That is the verdict of science, and the established truth of the world of science in one generation invariably becomes an established fact for the business world in the next generation.

#### DISCUSSION.

PRESIDENT—I hope that this first paper may only be a fair sample of what the rest will be. Mr. Hicks will be glad to answer any question in regard to this subject, or make any further remarks upon it.

CARPENTER—Let us hear from Youngers on this subject.

YOUNGERS—My general appearance would indicate that I would “irrigate.” However, I would say that Mr. Brown and myself are interested in irrigation in western Colorado. As stated in the paper just read, it is not all theory, but must be practiced. I believe we could make money by proper irrigation here.

CARPENTER—The question of irrigation is an important one to me. Perhaps many of you know that I have several fruit plantations in Colorado and Idaho. Would say that irrigation is something more than the mere act of turning on water—it means proper cultivation and the judicious application of water. I had a man tell me last summer that he had plenty of water. He seemed to think that all he had to do was to turn on the water and nature would do the rest. Trees can be killed very easily by too much water. I am very glad indeed that Mr. Hicks prepared this very able paper of his; there are many valuable points brought out that can be made useful for western Nebraska. When the people begin to wake up to the value of irrigation we want to be able to answer all their questions in regard to it.

DUNLAP—I do not believe that it will be necessary to irrigate in the valleys of western Nebraska, especially after the trees have been planted several years. At Fort Sidney they made beds about two feet wide and a ditch across at the head of the beds. Between these beds were smaller ditches, and at certain times they let in water enough to fill up these ditches between the beds.

HICKS—I have seen the place Mr. Dunlap speaks of. With regard to the opinion expressed by Mr. Dunlap in reference to the valleys between the sand hills, it will not be necessary to irrigate in such places. However, it would be a great help to the trees until they be

come large enough so that their roots reach the water underneath. Undoubtedly there are many situations where it will not be necessary to irrigate, but in nearly all of them it will pay.

CARPENTER—Even under the most favorable circumstances it is better to irrigate if it is done properly. Trees commence to bear from two to three years earlier when irrigated. I would irrigate every time.

HICKS—Some trees require very little water, and all these things must be learned. The cherry needs but little, less than almost any other tree. I would like to mention that Senator Stewart, of Nevada, a man who has had much experience in horticulture, said before the senatorial committee, which had a session at Ogalalla in 1889, that that portion of Nebraska next to the Colorado line is the very garden spot of this continent. That is his opinion.

DUNLAP—Will you tell us about the sand regions? Do you think there is enough moisture to support trees?

HICKS—Yes; Professor Fernow is now experimenting on foresting the sand hills. I hope he will keep it up until he gets them fully covered with trees. The country could be irrigated with wells (150 to 200 feet deep). The cost of raising water that depth precludes the idea of irrigating for field crops, but for gardens it will pay. For gardening and small fruit growing you can afford to do almost anything and get your money back. Sub-irrigation is carrying water under ground in pipes; or trenches covered with stone would be suitable for it. Various devices of that kind have been and can be devised, the idea being to carry the water under ground. It has the advantage of being fully covered up, causing less evaporation and less trouble in cultivating. If you carry the water in open ditches a great portion of it is lost by evaporation and other ways. Then when you spread water over the surface you do not get it to the very spot you want—it should get to the roots first. When you send it in the pipes it goes right to that place. Notwithstanding this difficulty of roots filling the pipes—and I believe this can be avoided—it puts the water just where you want it without any waste. In the market gardens of the east they heat the water and produce an early rapid growth, and get a half dozen crops where ordinarily you would get but one. The cost of sub-irrigation is very great and of course not adaptable for growing field crops, but in market gardens and for fruits it can be



done at a profit. After you once get the pipes under ground you have no further trouble about plowing and cultivating, as it can be done right over them.

JENKINS—At our meeting in Fairbury some years ago Mr. Stephens argued that irrigation by wells would not pay; that a wind-mill running night and day would not water but a very few rods of ground, and, consequently, it would not pay to try irrigation unless there was some other method of getting the water. I did not know about it, but concluded to try it any way and test the truth of it. I tried it with a hydraulic well and a good pump which would throw a full inch stream. I set the mill going and run it night and day, running the water in open trenches. The water was three days in going twenty rods. I found that Mr. Stephens was about right in his opinion. The water percolated perhaps three or four feet on each side of the trench.

HICKS—In California they irrigate about twelve acres with one inch of water—that is an inch as they call it.

CARPENTER—You let an artesian well which flows 50,000 gallons per day run all the time and it will irrigate about fifteen acres in Utah, where it requires more water than in California. Did Mr. Jenkins stir his ground well before letting the water upon it?

JENKINS—No.

STEPHENS—Would say that the area Mr. Jenkins could water with this well is so small in comparison to the cost of the fixtures that it would not pay. I would like information in regard to the north-western portion of this state; we have found trees to succeed very well indeed on the sand hills. These sandy hills furnish all the moisture needed. Why should these hold water better than loam, or ordinary prairie soil?

HICKS—(Explains by diagram.) The surface is all up and down; it is not level. The depressions have no outlet, and consequently are of the nature of reservoirs. Although the surface is sandy you would find on digging down that there is clay and rock underneath at no great depth. All that country has a very good rainfall, as high as twenty inches, and when the rain falls it runs into these depressions. The clay and rocks hold the rainfall to a certain extent, at least a very great portion of it, and the evaporation is not so great because of

the sand covering over it. You will find lakes in some of these depressions. Many of the lakes in the Elkhorn valley are the effect of percolation from the sand hills.

STEPHENS—We find that it is perfectly safe to take a contract to plant forest trees in the sand hills.

HICKS—In nearly all of the sand hill region you will find pond and lakes. It rains oftener in the sand hills than in the region surrounding them; in fact it rains so much there that a noted gentleman has said, "it rains every day in the sand hills." As a matter of fact it does not, but it rains very often. The cause is the same as that causing rain every day in some of the tropical climates. The sun shines very hot on the ground, causing a mist to rise from the moisture underneath, until in the afternoon this vapor has risen to a higher and cooler altitude sufficiently cold to precipitate the moisture in the form of rain. If Professor Fernow can succeed in foresting the sand hills it will be of immense value to the state.

DUNLAP—Tell us the difference in the growth of trees in the sand hills and on the plains.

STEPHENS—It is safe to plant and easy to raise trees on the sand hills, while a few miles distant, where the soil is compact and the moisture dissipated, it is very difficult. On the sand hill districts there is always enough moisture to raise a good growth of trees. The only difficulty in the sand hills is that there is so much moisture that the trees will grow too late in the fall if they have had late cultivation. We usually call ash a slow grower, but in the sand hills it sometimes makes a growth of four to five feet in one season from one year trees. On the average we get along much better in the sandy districts. We have had trees make large enough growth in two years to warrant leaving them without further cultivation.

BESSEY—I would like to ask Professor Hicks about frosts. Whether the conditions are such as to favor early frosts?

HICKS—I would not want to answer that question now. As to the matter of frosts, I have nothing of my own observation to tell. I will not attempt to throw any light upon it now.

DUNLAP—I find that the frosts do not strike on the hills for perhaps a month or more after it does in the valleys. In the open valleys it strikes much oftener.

A. J. BROWN—It occurs to my mind in reference to tile, that roots

of trees generally grow into them at the joints. We used to lay tiles for drainage, putting the joints in cement. The water soaks in through the tiles, and the roots cannot get in. This could be used to good advantage in laying tiles for sub-irrigation.

O. F. SMITH—Speaking about frosts in the sand hill districts, we notice generally that frosts strike in the valleys first. Corn lives much longer on the hills than in the valleys. There are no sand hills close to me, not nearer than twenty-five miles. Canyons are always hit first in our country.

STEPHENS—I notice it is almost night, and there is yet some work to do. We should hear the reports of the Secretary and the Treasurer.

#### SECRETARY'S REPORT.

#### NEBRASKA STATE HORTICULTURAL SOCIETY,

In account with R. N. DAY, Secretary.

1891.

#### *Credit.*

By annual memberships, January 14 and August 4, fifty-

eight.....	\$58 00
By life memberships, August 4, two .....	10 00
By warrant of State Auditor, September 11 .....	2000 00
By warrant of State Agricultural Society, November 28 .....	1000 00
Total.....	<u>\$3068 00</u>

1891.

#### *Contra, Dr.*

January 14, to cash paid Carpenter, balance due on salary...	\$24 96
September 11, to warrant of State Auditor .....	2000 00
November 28, to warrant of State Board of Agriculture.....	1000 00
January 19, to cash for postage, to G. J. Carpenter.....	3 00
March 24, to eight-five ten-cent postage stamps.....	8 50
December 15, to two hundred one cent stamps.....	2 00
December 15, to five hundred programmes.....	5 00
Total .....	<u>\$3043 46</u>
Total cash recieved.....	\$3068 00
Total cash paid out.....	<u>3043 46</u>
Balance on hand.....	\$25 00

Order No. 1, January 14, Munson & Walker, for lumber, fall of 1890.....	\$14 23
2, January 15, B. Fredenberg, premium.....	1 50
3, January 15, Johnson County Horticultural Society, premiums.....	20 00
4, January 15, W. R. Harris, premium.....	50
5, January 15, W. J. Hesser, premium.....	51 50
6, January 15, H. Craig, premium.....	27 00
7, January 15, Geo. A. Slayton, premium.....	8 50
8, January 15, J. G. Neff, premium.....	5 00
9, January 15, C. H. Barnard, premium.....	1 50
10, January 15, H. Craig, premium.....	1 00
11, January 15, W. J. Hesser, premium.....	3 50
12, January 15, G. J. Neff, premium.....	2 00
13, January 15, C. H. Barnard, premium.....	1 00
14, January 15, R. N. Day, expenses of delegates, janitor, and paper.....	31 40
15, January 19, F. W. Taylor, per diem as president.....	12 00
16, January 22, R. N. Day, labor and stationery..	18 40
17, January 24, Funke & Ogden, use of plates....	3 50
18, January 27, W. H. Korn, stationery and printing.....	9 00
19, February 6, R. N. Day, salary for February 1891.....	40 00
20, February 27, State Journal Company, five quires printing paper.....	1 00
21, March 9, Prof. L. Bruner, cuts.....	50 00
22, March 9, F. W. Taylor, stationery, stamps, labor, express, etc.....	20 25
23, March 9, R. N. Day, salary for March.....	45 00
24, March 9, R. N. Day, postage \$10, expressage \$3.45 .....	13 45
25, April 7, R. N. Day, postage.....	20 00
26, April 21, F. W. Taylor, postage.....	10 00
27, May 5, R. N. Day, salary for April and May,	80 00
28, July 6, R. N. Day, salary for June and July,	85 00
29, August 12, F. W. Taylor, at Hastings three days .....	9 00

Order No. 30, August 12, R. N. Day, freight and expressage,	\$12 97
31, September 9, R. N. Day, salary for August and September.....	85 00
32, September 9, F. W. Taylor, per diem and expenses at State Fair.....	34 50
33, September 9, Mrs. S. B. Stewart, committee work as expert.....	2 00
34, September 11, W. H. Rones, printing and stationery.....	9 00
35, September 11, Herpolsheimer & Co., cloth and flags .....	12 80
36, September 11, Hunter Printing House, flags, badges, etc.....	9 50
37, September 11, Hunter Printing House, express and boxes on books .....	22 00
38, September 11, W. R. Harris, Johnson county, premium .....	50 00
39, September 11, Mrs. Hannah Whitcomb, judging canned fruits.....	5 00
40, September 11, W. F. Jenkins, superintendent,	19 50
41, September 11, D. U. Reed, superintendent.....	19 50
42, September 11, C. H. Barnard, Pawnee county, premium .....	20 00
43, September 11, A. J. Brown, Fillmore county, premium .....	35 00
44, September 11, A. P. Job, Burt county, premium.....	10 00
45, September 11, G. A. Marshall, premium .....	25 00
46, September 11, E. F. Stephens, premium.....	141 00
47, September 11, G. J. Carpenter, premium.....	49 00
48, September 11, Omaha Floral Co., premium...	87 00
49, September 11, Chapin Bros., premium.....	100 00
50, September 11, Hess & Swoboda, premium.....	82 00
51, September 11, J. M. Russell, premium .....	22 00
52, September 11, D. U. Reed, premium.....	17 00
53, September 11, Slayton, Richardson county, premium .....	10 00
54, September 11, Mr. E. A. Sexon, premium.....	5 00

Order No. 55, September 11, J. M. Russell, ex-judge.....	\$10 00
56, September 11, Ben Haas, premium.....	141 00
57, September 11, W. J. Hesser, premium.....	47 00
58, September 11, Mrs. John S. Kelley, premium	9 00
59, September 11, J. G. Neff, premium .....	4 00
60, September 11, Mat Maul, premium .....	1 00
61, September 11, premium .....	4 00
62, September 11, P. F. Thomas, premium.....	9 00
63, September 11, J. G. Neff, labor .....	1 00
64, September 11, Miss Addie Gilmore, premium,	5 00
65, September 11, R. H. Davie, premium.....	25 00
66, September 11, Geo. Roberts, premium .....	10 00
67, September 11, Miss Maggie Davey, premium,	27 00
68, September 11, Mrs. Ann Parks, premium .....	16 00
69, September 11, Mrs. L. W. Pomerine, premium,	1 00
70, September 11, Mrs. C. H. Morsch, premium,	32 00
71, September 11, H. N. Wood, premium .....	21 00
72, September 11, J. W. Dillon, premium .....	5 00
73, September 11, Mrs. W. J. Bebout, premium,	38 00
74, September 11, Mrs. A. B. Baker, premium..	10 00
75, September 11, Mrs. John D. Slade, premium..	4 00
76, September 11, Mrs. N. A. Bacon, premium....	1 00
77, September 11, Mrs. M. W. Wiltee, premium..	10 00
78, September 11, Mrs. Leonard, premium.....	11 00
80, September 11, Mrs. J. L. Brown, premium.....	1 00
81, September 11, Mrs. Enos Herrington, pre- mium .....	2 00
82, September 11, Mrs. Porter Hedge, premium...	11 00
83, September 11, Mrs. T. H. Floyd, premium.....	6 00
84, September 11, Mrs. W. C. Crooks, premium...	8 00
85, September 11, Mrs. E. W. Baldwin, pre- mium .....	11 00
86, September 11, Mrs. John Lister, premium .....	1 00
87, September 11, C. F. Barnes, premium.....	1 00
88, September 11, Mrs. K. Tice, premium.....	2 00
89, September 11, Mrs. J. H. Edson, premium....	2 00
90, September 11, Mrs. Henry Eikenbary, pre- mium .....	10 00

Order No. 91, September 11, Mrs. Ella Stein, premium ...	\$1 00
92, September 11, Mrs. W. W. Dow, premium.	6 00
93, September 11, Mrs J. S. Agey, premium ...	2 00
94, September 11, Mrs. Mary Rouse, premium.	8 00
95, September 11, Mrs. Ester Smith.....	4 00
96, September 11, Mrs. V. H. Dyer, premium.	1 00
97, September 11, Youngers & Co., premium...	10 00
98, September 11, Peter Youngers, Jr., premium	42 00
99, September 11, Emil Haller, premium .....	1 00
100, September 11, J. R. Whitmore, premium...	2 00
101, September 11, Jno. P. Anderson, premium..	1 00
102, September 11, G. W. Colter, premium.....	1 00
103, September 11, Mrs. D. C. Simmons, pre- mium .....	2 00
105, September 11, G. W. Holland, premium.....	1 00
106, September 11, Hiram Craig, premium.....	89 00
107, September 11, W. R. Harris, decorations....	2 00
108, September 11, W. R. Harris, superintendent	24 00
109, September 11, A. J. Brown, work.....	1 00
110, September 11, Elias Beaver, committee work .....	1 00
111, September 11, Ola Anderberg, carpenter work .....	11 00
112, September 11, C. H. Frey, committee work	2 00
113, September 11, Elias Beaver, premiums.....	23 00
114, September 11, R. N. Day, premiums.....	9 00
115, September 11, C. H. Barnard, premiums...	10 00
116, September 11, A. Bingham, premium.....	2 00
117, September 11, Mrs. R. H. Stratton, pre- miums.....	3 00
118, September 11, Geo. A. Slayton, premiums,	17 00
119, September 11, P. A. Murphy, premiums...	18 00
120, September 11, Darling & Beck, premiums,	2 00
121, September 11, Clint Fisher, premiums.....	2 00
122, September 11, W. R. Harris, premiums.....	2 00
123, September 11, Geo. Becker, premiums.....	1 00
124, September 11, C. M. Crow, work.....	13 65
125, December 3, R. N. Day, salary November and December .....	85 00

SECRETARY'S REPORT.

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Order No. 126, December 11, S. P. Harris, laundering.....	\$3 00
127, December 11, S. P. Harris, labor.....	18 00
128, December 11, W. S. Sawyer & Co., premiums.....	33 00
129, December 11, M. J. Mosier, labor.....	16 00
130, December 11, D. C. Mosier, labor.....	50 00
131, September 11, O. F. Smith, superintendent,	21 00
132, September 11, W. J. Hesser, premiums.....	34 00
133, September 11, L. H. Stoughton, labor.....	12 75
134, September 11, L. E. Troyer, labor.....	11 25
135, September 11, Herpolsheimer & Co., cloth,	5 25
136, September 11, Lincoln Pottery Company, rent of vases.....	5 00
137, September 12, J. R. Gladdis, lumber and labor.....	9 90
138, September 15, D. C. Mosier, miscellaneous (see bill).....	26 75
139, September 15, Baldwin Bros., miscellaneous,	5 65
140, September 11, J. G. Neff, premiums.....	4 00
141, September 14, R. N. Day, express and other bills of expense.....	5 75
142, September 16, R. N. Day, postage stamps,	10 00
143, September 29, C. M. Parker, premiums.....	2 00
144, October 6, R. N. Day, salary for October...	40 00
145, October 10, Funke & Ogden, rent of plates,	45 00
146, October 10, W. H. Foster & Son, cut flow- ers.....	3 00
147, October 19, S. P. Harris, washing muslin,	3 00
148, August 30, F. W. Taylor, postage.....	10 00
149, November 23, R. N. Day, salary from Jan- uary 15th to February 1st, 1891.....	18 60
150, December 14, Frey & Frey, cut flowers.....	4 00
151, December 14, D. C. Mosier, for work done, plumbing .....	1 65



## TREASURER'S REPORT.

## THE NEBRASKA STATE HORTICULTURAL SOCIETY,

In account with PETER YOUNGERS, JR.

Balance on hand January 24, 1891.....	\$3148 81
September 9, from F. W. Taylor.....	10 00
September 11, from State Treasurer.....	2000 00
November 28, from State Agricultural Society.....	1000 00

Total.....	\$6158 81
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Warrants cashed as per list.....	2762 85
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Balance on hand.....	\$3395 96
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(Signed)

PETER YOUNGERS, JR., *Treasurer.*

No. 1, Munson & Walker.....	\$14 23
No. 2, B. Freidenberg.....	1 50
No. 3, Johnson County Horticultural Society.....	20 00
No. 4, W. R. Harris.....	50
No. 5, W. J. Hesser.....	51 50
No. 6, H. Craig.....	27 00
No. 7, George A. Slayton.....	8 50
No. 8, J. G. Neff.....	5 00
No. 9, Clyde Barnard.....	1 50
No. 10, H. Craig.....	1 00
No. 11, W. J. Hesser.....	3 50
No. 12, J. G. Neff.....	2 00
No. 13, Clyde Barnard.....	1 00
No. 14, R. N. Day.....	31 40
No. 15, F. W. Taylor.....	12 00
No. 16, R. N. Day.....	13 40
No. 17, Funke & Ogden.....	3 50
No. 18, W. H. Koms.....	9 00
No. 19, R. N. Day.....	40 00
No. 20, State Journal Co.....	1 00
No. 21, L. Bruner.....	50 00
No. 22, F. W. Taylor.....	20 25
No. 23, R. N. Day.....	45 00
No. 24, R. N. Day.....	13 45
No. 25, R. N. Day.....	20 00

No. 26, F. W. Taylor.....	\$10 00
No. 27, R. N. Day.....	80 00
No. 28, R. N. Day.....	85 00
No. 29, F. W. Taylor.....	9 00
No. 30, R. N. Day.....	12 97
No. 31, R. N. Day.....	85 00
No. 32, F. W. Taylor.....	34 50
No. 33, Mrs. S. B. Stewart.....	2 00
No. 34, W. H. Koms.....	19 00
No. 35, Herpolsheimer & Co.....	12 80
No. 36, Hunter Printing House.....	9 50
No. 37, Hunter Printing House.....	22 00
No. 38, W. R. Harris.....	50 00
No. 39, Mrs. Hannah Whitcomb.....	5 00
No. 40, W. F. Jenkins.....	19 50
No. 41, D. U. Reed.....	19 50
No. 42, C. H. Barnett.....	20 00
No. 43, A. J. Brown.....	35 00
No. 44, A. P. Job.....	10 00
No. 45, G. A. Marshall.....	25 00
No. 46, E. S. Stephens.....	141 00
No. 47, G. J. Carpenter Co.....	49 00
No. 48, Omaha Floral Co.....	87 00
No. 49, Chapin Bros.....	100 00
No. 50, Hess & Swoboda.....	82 00
No. 51, J. M. Russell.....	22 00
No. 52, D. U. Reed.....	17 00
No. 53, Richardson County Horticultural Society.....	10 00
No. 54, Mrs. E. A. Saxon.....	5 00
No. 55, A. M. Russell.....	10 00
No. 56, Ben Hass.....	141 00
No. 57, W. J. Hesser.....	47 00
No. 58, Mrs. John S. Keller.....	9 00
No. 59, J. G. Neff.....	4 00
No. 60, Mat Maul.....	1 00
No. 61, Charles Lindholm.....	4 00
No. 62, P. F. Thomas.....	9 00
No. 63, J. G. Neff.....	1 00

No. 64, Miss Addie Gilmore .....	\$5 00
No. 65, R. H. Davey .....	25 00
No. 66, George Roberts.....	10 00
No. 67, Miss Maggie Davey.....	27 00
No. 68, Mrs. Anna Parks.....	16 00
No. 69, Mrs. L. W. Pomerene.....	1 00
No. 70, Mrs. C. H. Marsch .....	32 00
No. 71, H. N. Wood .....	21 00
No. 72, J. W. Dillon.....	5 00
No. 73, Mrs. W. J. Beebout.....	33 00
No. 74, Mrs. A. B. Baker.....	10 00
No. 75, Mrs. John D. Slade.....	4 00
No. 76, Mrs. N. A. Bacon.....	1 00
No. 77, Mrs. N. W. Witter .....	10 00
No. 78, Mrs. Leonard.....	11 00
No. 80, Mrs. J. L. Brown .....	1 00
No. 81, Mrs. Ennis Harrington.....	2 00
No. 82, Mrs. Porter Hedge.....	11 00
No. 83, Mrs. T. H. Floyd .....	6 00
No. 84, Mrs. W. C. Crooks.....	8 00
No. 85, Mrs. E. W. Baldwin.....	11 00
No. 86, Mrs. John Liota.....	1 00
No. 87, C. F. Barnes.....	1 00
No. 88, Mrs. K. Tice .....	2 00
No. 89, Mrs. J. H. Edson .....	2 00
No. 90, Mrs. Eggenberry.....	10 00
No. 91, Mrs. Ella Steen.....	1 00
No. 92, Mrs. W. W. Dow .....	6 00
No. 93, Mrs. J. S. Agey.....	2 00
No. 94, Mrs. Mary Roush .....	8 00
No. 95, Esther Smith .....	4 00
No. 96, Mrs. V. H. Dyer.....	1 00
No. 97, Youngers & Co.....	10 00
No. 98, Peter Youngers, Jr.....	42 00
No. 99, Emil Haller.....	1 00
No. 100, J. K. Whitmore.....	2 00
No. 101, J. P. Anderson.....	1 00
No. 103, Mrs. D. S. Simmons.....	2 00

No. 105, G. W. Holland.....	\$1 00
No. 106, Hiram Craig .....	89 00
No. 107, W. R. Harris.....	2 00
No. 108, W. R. Harris.....	24 00
No. 109, A. J. Brown .....	1 00
No. 110, E. Beaver.....	1 00
No. 111, Ola Anderberg.....	11 00
No. 112, C. H. Fry.....	2 00
No. 113, Elias Beaver.....	23 00
No. 114, R. N. Day .....	9 00
No. 115, C. H. Barnard.....	10 00
No. 116, A. Brigham.....	2 00
No. 117, Mrs. R. H. Stratton .....	3 00
No. 118, George A. Slayton.....	17 00
No. 119, P. A. Murphy.....	18 00
No. 120, Darling & Beck.....	2 00
No. 121, Clint Fisher.....	2 00
No. 122, W. R. Harris .....	2 00
No. 123, George Becker.....	1 00
No. 124, C. M. Crow .....	13 65
No. 125, R. N. Day.....	85 00
No. 126, S. P. Harris.....	3 00
No. 127, S. P. Harris.....	18 00
No. 128, W. S. Sawyer & Co.....	33 00
No. 129, J. M. Mosher .....	16 00
No. 130, D. C. Mosher.....	50 00
No. 131, O. F. Smith.....	21 00
No. 132, W. J. Hesser.....	34 00
No. 133, L. H. Stoughton .....	12 75
No. 134, L. E. Troger .....	11 25
No. 135, Herpolsheimer & Co.....	5 55
No. 136, Lincoln Pottery Co.....	5 00
No. 137, R. J. Gladdis.....	9 90
No. 138, D. C. Mosher.....	26 75
No. 139, Baldwin Bros.....	5 65
No. 140, J. G. Neff.....	4 00
No. 141, R. N. Day .....	5 75
No. 142, R. N. Day .....	10 00

No. 143, C. M. Parker.....	\$2 00
No. 144, R. N. Day .....	40 00
No. 145, Funke & Ogden.....	45 00
No. 146, W. H. Foster & Son .....	3 00
No. 147, S. P. Harris.....	3 00
No. 148, F. W. Taylor.....	10 00
No. 149, R. N. Day .....	18 60
No. 150, Frey & Frey .....	4 00

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\$2,762 85

CARPENTER—I move to leave the reports of the Secretary and the Treasurer to a committee of three. Carried.

CARPENTER—The secretary of state has not complied with the law in regard to our reports. The law says that the secretary of state shall send a copy of the report to each public library in the United States; one to each secretary of local horticultural society in this state, and so forth; also to each member of the legislature, and these would be well distributed if they were given to the members. When I was secretary of this Society I figured up just how many it would take to give the required number of copies to the different places, and then had the remainder sent to my address.

PRESIDENT—We found that the reports were not being sent out according to the intent of the law, and we have made search at the capitol and found several thousand copies, which have been hauled down to the University building and placed on shelves for their accommodation. We shall send these out in quantities to whomsoever can properly distribute them.

STEPHENS—I feel sure now that the Society will make good use of them.

PRESIDENT—If there is any particular way you want to dispose of them, I would be glad to hear of it.

JENKINS—I had a few sent up to me two years ago. Nobody seemed to know that they could get such a book. Any one could place a hundred in any precinct in our county.

PRESIDENT—I have sent them out by express for the reason that it saves drayage here. It is about as cheap one way as another.

CARPENTER—I think it would be a good idea to make up our mailing list and take it to the secretary of state and say to him, “we

have brought you a list of names to whom we wish reports sent." I think he would be glad to send them out.

PRESIDENT—I name the following as committee on reports of the Secretary and the Treasurer: G. J. Carpenter, G. W. Alexander, J. W. Stevenson.

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## EVENING SESSION.

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LINCOLN, NEB., January 12, 1892.

### PRESIDENT'S ANNUAL ADDRESS.

This is something out of the usual line, and when I was first notified that I was put on for a president's address I said I would not attempt it; but after second thought I have concluded to give you a sort of outline which may sometime make a full fledged president's address. I will take up the subject of horticulture, of the Horticultural Society and its kindred interests to the state. I have found horticulture occupying different positions in different states with reference to the people and to the state.

I wish to take up some little time to show why our Horticultural Society should be on a better basis: One reason is, as we enter into horticultural pursuits, our higher and better cultivation of the soil and the necessary improvements which must be made, cause an advance in the price of real estate; not only the land on which are located the orchards and plantations, but also the land adjoining. We find as we grow in horticultural knowledge and put that knowledge into practical use, that the price of our property goes up in proportion to the extent of that knowledge. The effect of this is apparent. Let us take southwest Iowa, which ten years ago was considered the poorest section of the state. The people began to be interested in horticulture; they planted out orchards and small fruit plantations; all the time their land rose in value; and now, on the lands formerly considered the poorest in the state, there are more apples raised than elsewhere. The increase in values of farm property has averaged over 100 per cent. Some of that land cannot now be bought for two or three times what it would have sold for ten years ago. This is all attributable to the increase in fruit growing. Take Glenwood; there are more apples

shipped from that town than from any other in the west of its size; and few cities exceed it. History may have something to do with our solution of the problem.

Some fifteen years ago one man conceived the idea that in Mills county there could be grown fruit; I can remember when he was laughed at; people said that Record was "wild." Now if you go there and ask for the solidest man in the county they will refer you to Jim Record. History shows that the man who was away behind the times fifteen years ago, who didn't know that fruit could not be grown in Mills county, is the man who was really away ahead of the times, and has the start of those who laughed at him. He has followed the practice of growing and selling fruits satisfactorily; he has made considerable money out of it, too. There are members who meet here to-day who know about individual facts similar to this.

As to returns, that can be supported by investigation, I think those who raise fruits will agree that they will average very close to \$100 per acre each year on land that went begging at \$10 per acre ten years ago. I took up the matter of cost the other day in regard to this; went to a man who knows to a cent what his orchard cost him; we went very carefully over his books to show what he had spent. We took actual cost of the trees, cost of labor, the cost of keeping up his orchard to the present time, at eight years from planting. It figured up \$35 per acre in addition to the original cost of the land.

Now the question is, over what portion of the state can these results be attained? and there comes in what I think is the work of this Society, that we must get people to see what can be done; what part of the state is adapted to this kind of fruit; what part is adapted to that; what varieties succeed here, and what there. Whether varieties that do well in the southeast part of the state will succeed in the western part, and so on. This is where this Society can be of its greatest benefit to the state. There are a number of ways to bring this about, but the question is, what can our Society do to bring this about? If the interest of horticulture is of so much value as we think it to be, how are we going to be able to bring it about? How are we going to arrange forestry? How are we to bring out the facts concerning trees other than fruit trees? The only national law we have had to encourage the growth of trees other than fruit-bearing—the timber culture law—has been repealed. How are we going to do our part towards

encouraging this study and practice of forestry? How are we going to make a showing at the World's Fair that will be a credit to the state? These are some of the questions that we are come here to solve. Then if we take up the thought with which I started, as to what are the relations of the horticulturist to the state, the question is, how much ought we to depend on individual effort? How are we to manage to assist these persons in their efforts to reach here, to handle that? In order to have a society which is willing to do it, we ought to have some encouragement from the state. We now draw the sum of \$2,000 from the state, but this can be used only for the payment of premiums. Looking at other states, at Kansas, for instance, we find that they make an appropriation to cover the same thing as ours, only the appropriation is a great deal more than ours. The best way to promote horticulture is not to pay premiums at the State Fair—that is, not the best and only way. I believe more money ought to be given to the Experiment Stations. This will encourage and foster horticulture more than the mere paying of premiums. We ought to be able to come before the people in public places and claim our rights. We ought to be able to do as they do in Iowa. They are not called upon to pay a cent for premiums. We ought to be able to use, to have given us to use, three times as much as we have now. Could we not be able to obtain from our legislators that amount of money? Cannot we get it? Cannot we, as horticulturists, in some way provide and see that laws are enacted which will foster the planting of trees and orchards? Cannot we have some laws following the plan of other states, exempting a certain number of acres from taxation which have been planted to trees? Some laws like this should be put through. Such laws as the one mentioned this afternoon against bringing in any more injurious insects from other states, should also be put in our statutes. We have enough of these things now without allowing them to be brought in from other states. It is our duty to see to these things. Cannot we bring about some of these results through the medium of our Society, and as individual horticulturists? Cannot the State Society make use of the State University in some way? I wonder how many of the horticulturists know how instruction in horticulture is given in the University? Whether there is any interest taken in the work, or any good accomplished? There is an opportunity for great work in that line. The Society ought to take advantage of it. We have certain



lines of work that should be carried out here. The Society ought to suggest to the University what should be taken up and experimented with.

If we can bring about any of these results, if we can cause people to know methods by which they can grow five to ten times as many dollars worth from an acre as they now do, ought not we to be backed up in the work by the state? Are not we doing them enough of good so that we have a right to expect our Society to be assisted by the state? I have often wished that this might be brought before you. I hope the attention of the legislature may be called to these laws we wish enacted, and that they may be brought up in a legislative way. I hope that they may be carried out, to show what we have in this Society.

#### REPORTS OF DIRECTORS.

##### *No. 1—Southeast District. D. U. Reed, Director.*

REED—I was in hopes that we could get up a good report—something that would be valuable to the people. I have this report made up from the reports from five or six counties only; and I have it in aggregates:

MR. PRESIDENT AND GENTLEMEN OF THE NEBRASKA HORTICULTURAL SOCIETY: We have the pleasure of submitting for your consideration the following report from the First district, no report being received from the following counties: Polk, Richardson, York, Saunders, Hamilton, Clay, Otoe, Thayer, Lancaster, Nemaha, and Nuckolls, and from those reported great difficulty was experienced in getting the data from the grower. We would suggest that hereafter, in addition to the director or through the director, one man be appointed to each county, and he appoint one for each township, that correct figures may be gathered of this industry.

Very respectfully,

D. U. REED.

150,000 quarts strawberries, at 10 cents.....	\$15,000
200,000 quarts raspberries, at 10 cents.....	20,000
14,000 quarts gooseberries, at 8 cents.....	1,120
7,600 quarts currants, at 8 cents.....	608
300,000 quarts blackberries, at 10 cents.....	30,000
2,000 quarts juneberries, at 8 cents.....	160
200 bushels apricots, at \$2.50.....	500
15,625 bushels cherries, at \$2.....	31,250

2,450 bushels plums, at \$1.50.....	\$8,675
600 bushels pears, at \$2.....	1,200
20 bushels nectarines, at \$3.....	60
13,500 bushels peaches, at \$1.25.....	16,475
200 bushels crab apples, at \$2.....	400
1,200,000 bushels apples.....	420,000
	<hr/>
	\$540,248

I would suggest that we have a district director; then a man for each county; and a man for each township. In this way the township directors would report to the county director, and the directors of the various counties could report to the district director.

*No. 3—East-Central District. W. F. Jenkins, Director.*

JENKINS—I very have a short report to make. Would say that in our district there is not very much fruit growing yet, and you cannot expect very much of a report.

ARCADIA, NEB., Jan. 7, 1892.

The past season has been favorable for tree planting. There was much more fruit displayed at the fairs this past fall than ever before. The thinking, progressive class of people are coming to the conclusion that our part of the state is well enough adapted to fruit culture; that the cause for most of their losses and failures in the past was on account of their ignorance and carelessness. Those lessons have cost the people many thousand dollars. I am satisfied that in the future people will study more what they should plant, and cultivate and care for what they do plant more intelligently, and the results will be more satisfactory. The currant worm did some damage on my grounds the past season. Small fruits did well; cherries did extra well, so did grapes. There is fruit enough grown in different parts of the state that are never heard from to make a great help at the Exposition if we can get the people interested, but the question is how is it best to proceed? Give me your views, as you are long in the work you can help us. "Old men for counsel," etc.

I am yours in the work,

W. F. JENKINS.

ARCADIA, NEB., Feb. 10, 1892.

MR. DAY: I send you my report, which I should have left with you. I wish you to give me your ideas as to the best way to proceed,

or rather the best mode to recommend to the Society for establishing county and district societies—you know I am chairman on a committee for that purpose and make a report at the summer meeting. I consider it a very important move, and I wish with the balance of the committee to make such recommendations and suggestions as the Society in its judgment will consider best to adopt. I think it best to establish or organize what we can this fall so we can get all the help possible at the Chicago fair.

I would strongly recommend that you place the Missouri Pippin on our recommended list for the West-Central District. One of my trees (a Missouri Pippin), a four-year-old, stands in a show window at Loup City, to-day, with seventy-five apples on it. The tree is hardy, the apple is a good keeper and a good apple. I find there is at least ten days difference in the ripening of fruit here and in the southeast part of the state. The Miner plum was all gone for at least a week in Jefferson county before ours was fit to use. Cherries from Furnas county were in our markets when mine had scarcely commenced to color. There was not as large number of trees planted last spring as usual. The indications are that there will not be a very large number planted the coming season. It has been very dry in this district since harvest.

W. F. JENKINS.

Mr. Adams, of Almara, recommends the Missouri Pippin for the West-Central District. He had fifty bushels of apples this year from his Missouri Pippin trees. I find that there is at least ten days difference in the ripening of fruit here and in the southern counties of the state. Plums in Jefferson county are gone ten days before ours are.

*No. 4—West-Central District. E. Schroeder, Director.*

No report.

*No. 5—Lower Republican District. G. A. Strand, Director.*

No report.

*No. 2—Northeast District. C. W. Gurney, Director.*

CONCORD, NEB., January 25, 1892.

MR. PRESIDENT AND GENTLEMEN: In my report as director of the second district, were I to make anything like an extended one from each of the seventeen counties comprising it, it would be too lengthy.

I shall endeavor to be as brief as I can and do justice. In this county, as well as in Cedar, Pierce, Wayne, Madison, Stanton, and Cuming, the conditions are much alike.

*Strawberries* were a fine crop where given proper care. Many cover too early in fall and smother them out; they should not be covered till ground is frozen. Varieties giving best satisfaction, Jessie, Buebach No. 5, Crescent, Capt. Jack, and Warfield No. 2.

*The wild raspberry* is the only one that can be depended upon to endure our winters without protection. The Souhegan, Tyler, Gregg, and Mammoth Cluster are the favorites where protected by snow cover or laying down and covering. Turner is the best red, and bore a full crop last year without protection.

*Currants* are all perfectly hardy and bore well the past year, though never as heavily here as in eastern Iowa. They require a very rich ground and some shade or protection from hot winds and sun from the south.

*Gooseberries* are successfully grown, and bore their usual heavy crop. The Downing is best, though Houghton is excellent. Industry not fruited on my grounds yet, though some of the neighbors have fruited it and give it extravagant praise.

*Blackberries.*—The Snyder and Stone's Hardy are both grown by me, but the latter is nearly worthless. I set my Snyders on the south side of a Russian mulberry hedge. The snow covers them and crush down many, but they fruit just the same, although in some instances not more than a quarter of the wood is unbroken. In Cuming county Mr. Fleming has the best natural Snyder blackberry patch I know of. It consists of about one acre, on a level piece of high land, and in an old and rather thinly-planted cottonwood grove. The canes frequently grow ten feet high, are left without any care, and have not winter-killed for ten years, nor failed to bear a crop except when a long drouth occurs at fruiting time. This berry will not succeed in box-elder groves.

*Grapes* have borne their uniformly good crops. The Concord is the favorite and for all purposes the best grape. When fully ripe it is of good quality, and does not cloy like many other varieties. I have here in fruiting the Worden, Moore's Early, Brighton, Delaware, Lady, Janesville, and several varieties of Rogers, also Empire State, Niagara, Pocklington, and others, and several varieties for trial

not yet fruiting. The Brighton is best in quality, but seems to be a shy bearer while young; may improve when older. Pocklington is a good bearer, very handsome, and a few are relished, but soon cloy. The Worden is a good grape and, like the Brighton and Pocklington, should be in every collection. Janesville, although not of good quality, is valuable for arbors, as it will stand uninjured on trellis.

*The Russian mulberry* has elicited more different opinions than most any other tree or fruit. When known and appreciated on its exact merits it is in this latitude a very valuable tree. Perfectly hardy, an immense annual bearer, fruit increases in size as tree advances in age. When mixed with currants it is an excellent fruit, and will generally be mistaken for the blackberry. I have met many people who prefer the fruit to any other. For a wind-break two rows are equal to one row of evergreens. For this purpose they should not be pruned, and planted about two feet apart.

*Cherries* have borne for the past three years full crops, and now, January 25 (It will be remembered that owing to sickness this report is not made till ten days after the winter meeting), the buds are uninjured, although we have had, as reported, from 30 to 44 degrees below zero in different parts of Dixon county. I have examined to-day English Morello, Early Richmond, Oriel No. 23, Broussalaer Bronne, Riga, Grotto Imperial, Double Natte, Grotto Precoce, Spate Amerelle, M. Fruhe, M. Hateur, Ostheim, and others. Very few buds show a slight discoloration; about five-sixths are perfect. The Ostheim has not fruited heavily yet, and may be tender in fruit bud. What fruit there was was of good quality. English Morello and Early Richmond have borne the most fruit.

*Russian Apricots* have a few friends and many enemies. Hardy in tree, we have, or had, concluded they were too tender in fruit bud for the north. Last year, after a mild winter, we raised a few of the Catharine and Alexis on trees which were partly covered with snow. Fruit buds killed last winter before the peach buds did, and at about 20 below. To-day, after the most intense cold ever known here, the buds are four-fifths intact. What is the reason for this? The only two radical differences in the conditions would be this: Last year the cold was accompanied by heavy winds, and the ground in the fall was very dry. This year our lowest temperature was at midnight, January 18,

and perfectly still. The ground, too, was soaked with water when it froze. I shall watch this with much interest. If the moisture in the ground is to be credited for this surprising condition, a remedy for fruit-bud killing suggests itself.

*Plums* are easily grown, and last year was no exception to the rule of heavy crops. I would place them for value in the following order: De Soto, Robinson, Weaver, Forest Garden, Quaker, and Miner. The Wild Goose is too tender here, and seldom bears any fruit. Forest Garden is most troubled by the curculio.

*Standard Apples* gave the best results for some years, although 1890 gave us a good crop. The Willow, Iowa Blush, Winesap, Wealthy, Utter's Red, Haas, Summer Queen, Duchess, and Yellow Transparent are all fruited in this vicinity. In some places—notably a few miles south of Battle Creek, Madison county—the Ben Davis is successfully raised. In the orchard of James Gibbs, on a south slope, the *south row* protected by a heavy grove on the *south of the orchard*, are about twenty Ben Davis which have been bearing for twenty years and are sound yet. I am planting the Ben Davis here, and believe that if properly handled it will succeed anywhere in this district, but no one should plant it largely without giving these conditions careful study. In South Dakota I have seen several orchards in which the Walbridge is the main apple. This, and the Perry Russet, I found growing and bearing heavily. One hundred miles north of this, also, the Grimes's Golden thriving in Yankton county. We have here several orchards of from five to twenty acres of apples and one in this county of 100 acres, owned by D. P. Sherwood, of Ponca. Only seven acres are in bearing, which brought him an income of \$1,000 in 1891, and about the same in 1890. The St. Lawrence is his most profitable apple, and these trees at twelve years old pay him each ten per cent interest on \$100. He manures the surface heavily each year, and claims by this he will get annual crops, and the results seem to justify his theory.

*Pears* are little grown. Many are planting some of the Russians sparingly, but no results have been reached yet.

*Blight* for the first time struck us last summer. I believe pear and apple blight to be the same. It first attacked a Keiffer standing in an abandoned part of the nursery, and in a few weeks spread to the sur-

rounding apples and crabs. I cut down the whole trees affected and burned them. Repeating this three times cleaned it all out.

*Bark bursting* struck us last fall for the first time and was very severe on yearlings, but we cut them all down to the ground below the injury. This bark bursting is caused by freezing unripe wood. Some young orchards suffered severely, though I lost none from that cause in an orchard of fourteen acres one and two years planted.

Accompanying this find reports from various counties in the Second district.

Respectfully,

C. W. GURNEY.

NORFORK, NEB., Jan., 4, 1892.

*Mr. C. W. Gurney, Director of Second District, Concord, Nebr.*—  
DEAR SIR: In replying to your request of December 14, will state the fruit crop of Madison County this season was larger and of better quality than it ever has been. Currants, gooseberries, and cherries were very heavily loaded with fruit. Most all apple orchards that were old enough bore fruit this season. Trees look well all over the county and owing to the late rains we had the latter part of November and the first of December, trees are in a good condition to stand the winter and go through in good shape. Everyone feels very much encouraged that most all kinds of fruit can be grown.

Yours truly,

E. D. HAMMOND.

DAKOTA CITY, NEB., Jan. 5, 1892.

*C. W. Gurney, Concord, Nebr.*—DEAR SIR: In 1888 I planted an orchard of two hundred apple trees in an open level field, no protection. I checked field-corn in this young orchard every year, giving the corn and trees a thorough cultivation. Never lost but two trees and they were destroyed accidentally. I branch low from one to two feet high and to-day these trees look as healthy as cottonwoods. My trees are the Wealthy, Haas, Walbridge, Wolf River, Salome, Rubicon, Duchess, Price's Sweet, and Yellow Transparent. Not having any bearing trees of my own I called on Mr. Dennis Armour, who has had more experience in the fruit business than any other man on the Missouri bottom in Dakota county, and together we made out the following list:

## APPLES.

*Summer.*

Red Astrachan, half hardy.

Duchess, hardy ; best summer, commercial.

Whitney No. 20, hardy ; productive ; not valuable as a commercial apple.

*Fall.*

Wealthy, hardy ; best commercial apple.

Utter's Red, hardy.

Plumb's Cider, hardy ; very productive, and good commercial.

*Winter.*

Ben Davis, worthless.

Jonathan, not hardy.

Geneton, not hardy.

Grimes's Golden, hardy, but shy bearer.

Wolf River, hardy, productive, early bearer and best commercial.

## CHERRIES.

Early Richmond, hardy when trees are protected from sun blister.

Ostheim, hardy, vigorous grower ; blisters less than the Early Richmond, also very productive.

## PLUMS.

Miner, hardy ; very productive and an excellent commercial plum.

Wild Goose, hardy ; very early, about the 20th of July, but shy bearer.

Forest Garden, hardy ; excellent quality ; good seller, but badly injured by curculio.

## RUSSIAN APRICOTS.

Tree hardy, but very shy bearer.

## GRAPES.

Moore's Early, hardy ; two weeks earlier than Concord and equal in quality.

Concord, best commercial grape.

Lady, hardy ; abundant bearer, but poor seller.

Pocklington, hardy ; a good white grape.



## CURRANTS.

Red Dutch and White Grape, recommended as best.

## BLACKBERRIES.

Snyder, rank grower, but winter-kills.

## GOOSEBERRIES.

Common varieties are very hardy and productive; with plenty of sunshine there is no mildew.

## RASPBERRIES.

Both the red and black raspberries are very productive when properly cared for and protected from winters.

## STRAWBERRIES.

Crescent and Sharpless are immense bearers, but must be protected in the winter.

Yours,

JACOB F. LEAMER.

## KNOX COUNTY, NEBRASKA.

*C. W. Gurney, Director Second District*—SIR: In making a horticultural report of Knox county, would say that the early settlers did not engage extensively in fruit culture, consequently there are not very many bearing orchards. Those are in a healthy condition and promise good returns for the labor and care bestowed upon them. Among the first settlers there were many difficulties, mistakes, and failures, but they can be traced to one of the three following reasons:

First—Want of a practical knowledge of fruit culture.

Second—Careless and heedless methods of cultivation.

Third—Selection of kinds not adapted to the locality.

The pressure of work among farmers who were not able to hire is a partial excuse for the second cause. Persistent experimenting has partly overcome the third, and the result is there has been more orchards and small fruit planted the last two years than the five years previous. Among the things learned essential to success is thorough cultivation, keeping the ground clean of weeds or crops. No mulching is as good as two inches of top soil constantly stirred clear to the trunk of the tree.

In failure of kinds adapted to our locality none are so marked as the Ben Davis. Everybody planted them at first. The longest I

have known one to bear is two years. Nine-tenths die before they ever bear. I will name the kinds that have proved good and hardy. There may be others of which we have yet to learn, some of which are on trial: Summer apple, Duchess of Oldenburg, Haas Plumb's Cider, and Utter's Red, for fall. The Haas is a fast-growing and fine-looking tree, but the fruit is rather poor quality. The Wealthy does the best for winter apple, but is tender and needs to be handled carefully to keep long.

All kinds of crab apples do well here, especially Whitney No. 20. I sold crab apples enough from my orchard this season to pay for all the fruit trees I have purchased, besides keeping a full supply for the family.

Cherries grow finely here, but do not bear as the appearance of the tree would indicate. Will some expert in horticulture tell us the difficulty and remedy?

Tame plums do well, yet they are not much better in quality or size than some of the wild ones.

This is a splendid county for grapes and would bear profusely if ever pruned. Concord, Moore's Early, and Worden are raised. Probably others would do well.

Blackberries are a failure except in the shade, where they do well. This was learned by accident and many are now being planted in groves.

Black and red raspberries are not a success here but may do in the shade. I am trying it.

Respectfully,

R. H. MASON.

LYONS, BURT CO., NEB., Jan. 4, 1892.

C. W. Gurney, Esq., *Director Second District*—DEAR SIR: I think may safely say results of fruit culture had been highly satisfactory where a proper amount of intelligence, care, and attention has been used. The condition is good, yet some trees have been injured the past few years. There is a great tendency to plant too many summer varieties and too few winter.

I have, perhaps, the best orchard about, and might say the only one of any size. It contains about ten acres. I raise about twenty-five bushels of cherries each year, mostly Early Richmond; some Late Richmond, and some English Morello. The land occupied would pay

\$300 per acre for use of land one year. It was four or five years ago my Ben Davis bore at a rate and sold at a price to pay me at the rate of \$500 per acre for use one year. The orchard has been paying me at about \$50 per acre yearly, for the ten acres. This year I had about 1,500 bushels; paid me about \$800, or \$80 per acre, which makes a fair claim to call the orchard worth \$800 per acre, as it pays ten per cent on that.

The best apple I raise is the Jonathan; the best paying is the Ben Davis; the best bearing is Duchess of Oldenburg, which run at the rate of about 1,000 bushels per acre each year. I have Genetons that bore at the rate of 1,500 bushels per acre, also Winesaps the same. Perry Russett also bore well.

I pasture orchard with swine and manure it as often as possible.

My estimates are very nearly correct as I am very careful and attend to things personally.

I have given the main facts. Any more questions to ask I will answer to best of my ability.

Respectfully,

J. E. SPIER.

P. S.—Leading standard winter varieties are Ben Davis, Winesap, and Geneton. Were I only going to plant three kinds, would plant them. Sheriff does nicely and is a fine apple. Jonathan might do better now, but my trees were injured, I think they were too heavily loaded four or five years ago, and then bad winter came on. I would try them again.

J. E. S.

PILGER, NEB., January 4, 1892.

*Mr. C. W. Gurney*—DEAR SIR: In reply to your communication in regard to horticulture in this part of Stanton county I submit the following: When I came here nine years ago next March, there was not much interest taken in large fruit for the reason that what fruit trees had been planted had not done well from causes which generally beset new countries, viz., non-preparation of ground and the idea that hog and hominy furnish all the happiness necessary this side of the happy hunting ground. But since it has been demonstrated that we can raise some of the best fruit grown, we are taking more interest.

The last year small fruit of all kind did finely. As far as my observation goes, the apples, cherries, plums, and apricots are healthy, made good growth, and where old enough, have borne well, and I see

no reason why we cannot have as good fruit here as anywhere, with proper care and culture. . A lady who had just come from California last summer remarked (while looking at my Haas and Duchess) that she saw nothing while in California that beat them for such heavy loads of fine fruit. I have one Haas of my own setting eight years old next spring (from graft) which has borne the two last years, and while speaking of the Haas I want to say it will be hard to get any kind to beat it, either in bearing or growth of tree. The Duchess, the Fameuse, and Gross Pioneer are, to say the least, worthy a place in every orchard, besides several other varieties I do not know the names of. There have been no apples shipped to our town which surpass our home grown. I could sell apples in my orchard for more than those shipped in would bring in market. So I do not hesitate to say that by selecting the hardy varieties we can have just as fine fruit and plenty of it as we need. I would not have you think that I am so enthusiastic in fruit growing in this country that I believe fruit trees will thrive either in corral or weed patch, but give it a good showing and we will be well paid in most luscious fruit.

Yours, etc.,

A. BLACKSTONE.

WAYNE, NEB., Jan. 6, 1892.

C. W. Gurney, *Director Second District, Concord, Neb.*—DEAR SIR: In this county fruit growing as yet is only in its infancy. There are but few bearing orchards, and the growing of small fruits has been very much neglected; but farmers are beginning to turn their attention more to fruit growing. There is so much to do when people first go into a new country that much has to be postponed or neglected until such time as it can be attended to. I do not say, or believe, that the planting of fruit should be the part postponed, but I believe that is the history of this northwestern country generally.

Eight years ago it was hard to find a man who believed that it would pay to plant apple trees here. They would tell you that wild plums and gooseberries and something of that kind would do all right, but there was no use planting apple trees. But that has all changed, and farmers are turning their attention more to this branch of husbandry. There has been enough planted to satisfy even the most skeptical that fruit growing can be made profitable as well as raising corn, cattle, and hogs. The enormous amount of money going out of the

county yearly for our supply of fruit has awakened much inquiry and interest in this matter, and I believe that the time is not far distant when instead of the farmers going to town for their supply of fruit will be supplying the market; when instead of shipping fruit into the county we will be shipping it out; money will be coming in for fruit instead of going out, which undoubtedly is the way it should be. Planting fruit trees is no longer an experiment with us, because we see that those who have planted and taken care of them are reaping a rich reward of fruit.

I am convinced by my limited observation and experience that at least the hardiest varieties of apples and crab apples, plums, cherries, grapes, gooseberries, currants, raspberries, blackberries, strawberries, and probably much more can be grown, not only in sufficient quantities for home use, but also for sale at a profit, as well as other crops that we grow; and this much I would emphasize, that every farmer in the county can, and should, have at least all the fruit that the family can use growing on the farm; that there is no good excuse for any man in Wayne county denying himself and family these absolute necessities of life, or going to town to buy them after being here long enough to have them growing at his door. What we want is "home production."

I think we should plant fruit as soon as we can get the ground ready for it and no sooner, and that is as soon as it is ready for a crop of corn. I have noticed some instances where farmers planted fruit trees before they had the ground ready, and as a matter of course they did little or no good. Some neglected to fence after planting, and allowed the stock to destroy their trees; and in many cases wind-breaks were planted immediately north of the orchard and the trees were crushed by the snow banks lodged on them during the winter. Others did not cultivate sufficiently, or seeded to grass when the trees were too young and allowed sod to grow around the trees and retard their growth. Some were injured by the drying winds and hot sun by not having any protection on the south and west. The orchards do the best that are protected on the south by trees, or even a few rows of corn is better than no protection. I have seen young trees do fairly well that had no protection except a barrel stave southwest of each tree. I see some orchards that would do better if they were manured more frequently. Nothing responds more quickly to manure than

trees, and I do not know of any that were injured by manuring, and I have known some young orchards that were manured every year for several years in succession and they did very well.

More apple trees have been injured and destroyed by "blight" than from any other cause. The Transcendent crab has suffered the worst, the Hyslop probably the next.

Of forest trees, cottonwood, willow, box elder, white ash, catalpa, soft maple, and walnut are the principal kinds planted. And I must say, notwithstanding all that has been said against them, that the cottonwood and willow have been the most useful of all the forest trees planted on account of their rapid growth. They have been like the friend that helps you when you need the help. And if I was starting a new place to-day, while I would plant different varieties, the first would be the cottonwood and willow, but I would not plan them too close to my buildings.

Yours very truly,

DAVID CUNNINGHAM.

ARLINGTON, NEB., January 4, 1892.

*Mr. C. W. Gurney, Concord, Neb.*—DEAR SIR: Your letter of some time ago came in due time, and will now answer to the best of my ability.

Horticulture in Washington county is gradually coming to the front. From year to year this branch of business is gaining on grain raising and other branches of agriculture. Ten years ago bearing orchards were very few, and winter apples (grown in Washington county) were almost unknown. Now we find them in nearly every cellar in the county. The county has more than supplied itself with apples for the last four or five years. There have been hundreds of varieties planted and tested, and the most successful ones so far are Duchess, Saxon, Wealthy, and Utter's Red, for summer and fall, and Winesap, Janet, Iowa Blush, Ben Davis, and Walbridge, for winter. However, we have a great many others bearing well, and trees moderately healthy in different parts of the county, though when we are looking for a tree that we can depend upon I think we had better stay pretty close to the above named list.

The apple crop last year was about an average one. The prices were a little lower than the year before. Summer apples sold at from twenty-five cents to fifty cents; winter apples at from sixty cents to

one dollar per bushel. There are a few orchards in this county that yield from 2,000 to 4,000 bushels per year, and their owners say that they derive more clear gain from their orchards than all the rest of the farm.

Plums and cherries do fairly well, are very productive. Plums gave a fair crop last year. The most successful of those planted are the Miner, Forest Garden, Wolf, and Wild Goose. The Wild Goose is the most profitable market plum, as it has the market all to itself on account of ripening early. Price from one to two dollars per bushel. Cherries have not missed a crop for three years; last year's crop was the heaviest of the three and ahead of any I ever saw here or in the east, as every tree, on the highest hilltop or in the lowest valley, on north or south slope, in shade of other trees or in the sun, were loaded just the same. They sold for from eight cents to ten cents per quart. The Early Richmond and English Morello are our leaders as yet. However, the Montmorency and Wragg seem to be attracting attention, and I feel that in the near future the four will all stand abreast. The English Morello is the best annual bearer of the first two mentioned.

Pears are still in the background, blight being the trouble.

Grapes seem to be at home here, and instead of buying grapes, as we did a short time ago, we are shipping tons of them west. Arlington alone shipped over twenty-five tons last year. The Concord is still at the head, but the Worden and Moore's Early do as well, and are coming in favor as they become known. The oldest vineyard (of any size) in the county is on Ed. Eggbert's farm, known as the old Warner farm, three miles southeast of Arlington; it was planted twenty-four years ago. I don't know the number of vines, but it covers a little over an acre of ground; has borne heavy crops for twenty or twenty-one years, missing two or three years during that time. I have a report of the crop of 1887, which was \$900 net, fruit sold at four and a half to five cents per pound; also of 1890, which was 20,000, sold at three cents, total amount received, \$600; 1891, 18,000 pounds, sold at about two and a half cents, amount received, about \$450. This vineyard is on high, level land, hemmed in on the north, west, and south by an old grove and orchard, and a row of old maple trees on the east. The vines have been moderately pruned, but never laid down

or protected in any way. However, I deem it necessary to cover the vines, especially when the vineyard is in an exposed place. Grapes gave a full crop last year.

Blackberries and raspberries did not yield over two-thirds of a crop last year. They do well and are bearing in all parts of the county, and are found very profitable where planted for market. The Snyder is about the only blackberry planted. Of raspberries the Gregg and Tyler stand at the head.

Taking everything in consideration, the outlook for fruit growing is very flattering.

G. A. MARSHALL.

NORTH BEND, NEB., Dec. 16, 1891.

*C. W. Gurney, Esq., Director Second District.*—DEAR SIR: The apple crop of Dodge county, for 1891, was the largest ever raised in the county. There was a considerable surplus of summer and fall apples, but not enough winter apples for home consumption. Larger orchards are being planted and thousands of young trees are beginning to bear, and in a few years this county can ship out large quantities of apples. Many pear trees have borne fruit this year and last, and planters are encouraged to plant more of them. Cherries and plums have yielded a very bountiful crop, of both early and late varieties. The varieties of cherries doing best are the sour sorts, such as Early Richmond and English Morello. The Wild Goose and Miner plums are the principal varieties in bearing. Currants, gooseberries, juneberries, strawberries, raspberries, and blackberries, and grapes, have yielded the largest quantity and finest quality of fruit known in this county.

There is a liberal increase in amount of nursery stock planted in the county, but cannot give statistics of acreage or percentage of increase.

Truly yours,

J. W. STEVENSON.



## MORNING SESSION.

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LINCOLN, NEB., January 13, 1892.

Called to order by President Taylor. Minutes read by the Secretary.

### REPORT OF COMMITTEE ON SECRETARY'S AND TREASURER'S REPORTS.

CARPENTER—We have examined the reports of the Secretary and the Treasurer, and find them correct to the best of our judgment.

HARRIS—I move to accept the report and discharge the committee. Carried.

### ELECTION OF OFFICERS.

PRESIDENT—In what way shall the election proceed? The regular way has been by ballot. Unless there is some motion to the contrary, we shall proceed in that way.

MOSHER—I move, Mr. President, that we proceed to the election of officers by ballot. Carried.

SLAYTON—I move that we proceed to take an informal ballot for President. Carried.

GOODRICH—I move that we vote by roll call.

—I move to amend by making the first ballot formal.

BELTZER—We want to know about this thing. I saw something like this three or four years ago, and it seems we must make some rule regarding this. There should be some other thing in this Society besides election.

Amendment lost. Motion carried.

PRESIDENT—I will appoint as tellers, Messrs. S. S. Lewis, A. J. Brown, G. A. Marshall, and V. W. Goodrich.

Ballot resulted as follows:

Barber .....	1
Stephens.....	55
Harris .....	1
Barnard .....	17

Reed.....	4
Taylor .....	4
Mosher.....	1
Total.....	83

CARPENTER—I move to make Mr. E. F. Stephens President by the unanimous vote of this Society. Carried.

STEPHENS—I would nominate for the office of Secretary, Mr. F. W. Taylor, and move that we proceed to a formal ballot.

MARSHALL—I nominate Mr. R. N. Day for the same office.

BELTZER—Let us proceed in the general way. Let us all be satisfied.

BARNARD—The motion was to proceed by informal ballot.

—I move you that we proceed to vote by formal ballot.

BELTZER—I move to amend by striking out the word “formal” and inserting “informal.” Amendment carried.

Motion carried.

Ballot for secretary resulted as follows:

Taylor .....	72
Day .....	26
Total.....	98

CARPENTER—I move that we make the informal ballot formal. Carried.

SLAYTON—In order to facilitate business, I move that the chairman of the majority caucus present the “slate” and we will proceed to elect them all by acclamation. Ruled out of order.

REED—I move to suspend the rules and elect Peter Youngers, Jr., Treasurer of this Society.

GOGRICH—I do not like the way things have been running this morning. If there is nothing in this, let them be relieved; there are others who are capable of filling their places. It is almost as bad as the “big 4.”

JENKINS—I move to amend by saying that if you will show the slate we will elect all of them at once. Amendment out of order.

Motion carried.

CARPENTER—I move to suspend the rules and elect D. U. Reed, First Vice-President. Carried.

BARNARD—I move that the rules be suspended and W. F. Jenkins elected Second Vice-President.

MOSHER—I nominate for that place, Mr. O. F. Smith.

JENKINS—Mr. President, I respectfully decline to be a candidate for the office.

BARNARD—I move to suspend the rules and elect O. F. Smith to the office named. Carried.

CARPENTER—For directors of this Society, to act in conjunction with the other officers as members of the Executive Committee, I would name W. J. Hesser, D. C. Mosher, and J. M. Russell, and I move that the rules be suspended and the secretary instructed to cast a ballot for the three. Carried.

STEPHENS—Mr. President, we have a large amount of work to do from now on until the World's Fair in 1893. For the position of horticultural superintendent of the Nebraska exhibit at the World's Columbian Fair in Chicago in 1893 we need a man of wide acquaintance to represent us there. We have power to recommend to our Board of Commissioners the name of the man we want for that place. I would suggest the name of G. J. Carpenter.

BARNARD—I rise to a point of order; this is not in order. The printed programme was made yesterday our order of business for to-day; this does not come under the head of election of officers, and I move that we proceed with the programme.

PRESIDENT—The point is well taken.

#### REPORTS OF DISTRICT DIRECTORS.

No. 6—Southwestern. John H. Powers, director. No report.

No. 7—Lower Niobrara. Mr. Beebe, director. No report.

No. 8—Northwestern. J. J. Adams, director. No report.

#### REPORT OF METEOROLOGIST.

PRESIDENT—Yesterday we passed over the reports of some of the standing committees. I notice that Professor Swezey is with us to-day. We would be glad to hear from him on meteorology.

SWEZEY—Mr. President, my subject is not a very prepossessing one to the average person. The weather is never a very interesting subject—it is usually “dry”—and so is Nebraska weather dry. There are two questions to be considered: What can the Nebraska Weather

Service do to help the Nebraska Horticultural Society, and what can the Nebraska Horticultural Society do to help the Nebraska Weather Service, what is it doing? and the like.

The Nebraska Weather Service is a volunteer organization numbering now over seventy observers. Each is supplied with simple instruments, a thermometer, and a rain gauge. Headquarters is at Crete. The results are published in the form of a bulletin. The organization is voluntary, nobody gets anything out of it, and each man furnishes his own instruments. It was organized fifteen years ago with a few observers under the direction of Professor Bailey. Afterwards under the direction of Professor Thompson; he asked me to take charge of it. I have for a number of years attended to the work myself. As to our relation to the United States Weather Bureau, ours is entirely independent, yet the Nebraska Weather Service furnishes much valuable information for the United States Weather Bureau at Washington. We do not send out weather predictions; those are furnished by regular telegraph. The United States Weather Service co-operates with us. Some years ago the United States signal office detailed one member to assist us. In these ways we co-operate. In the distribution of weather forecasts they depend largely on us as to where to locate stations. Requests for such positions are always referred to us, and our recommendations are most always taken. We have for some time past furnished part of the agricultural press of this state a carefully prepared report of the weather for the year. The B. & M. railroad has been very kind by furnishing observers along its line of road; they are very glad to help us. In summer we issue a weekly crop bulletin, which is better in every way than the ordinary crop reports published in many newspapers. There is no reason why they should not be accurate. They are of considerable value to the farmer.

CANFIELD—What practical value is there in this?

SWEZEY—I do not know. Everything of practical value has been found by patient study of things. They are not discoveries, but results of careful study. The patient study of these conditions are of practical value. I believe we shall discover new possibilities in growing crops by noticing the weather. We have scattering observations covering over forty years; and in all have about fifteen years complete. Within the last two or three years we have been able to push

our stations all over the state. I specially wish to bespeak your interest in this work. I should be glad if you would help us in establishing new stations in various parts of the state. We should especially value reports received during the crop season. We receive from nearly thirty or forty observers during that season. We want to increase our corps of weather reporters. In the matter of weather predictions, you are able to judge whether or not they are of value. There are radical difficulties in the way of our getting much benefit in the western states from these weather predictions. It is a familiar fact that the predictions rarely reach us until we have the weather here. We in Nebraska are so near to the place where most of those changes originate, that by the time the report is telegraphed to Washington, compiled and returned, the weather is here. Some special forecasts with regard to frosts might be of value to us. The chief of the signal service intends to furnish some special frost warnings, which will be of much value to those who are in easy reach of the telegraph offices. Predictions of frost can be managed much more easily than other weather forecasts. Temperature is not the only condition necessary to the formation of frosts: sometimes the thermometer falls to thirty-two degrees and there is no frost; at other times, when it is as high as thirty-five degrees, there is a sharp frost. I do not know whether there is anything in this any more than you do. These are some of the ways in which we can be useful to you. I shall be glad if you will help us to establish new stations.

DUNLAP—I think the suggestions are good. If we could have special frost warnings it would be of great value to the fruit grower; he could be prepared with “smudges” on nights when a frost was imminent.

SEYMOUR—I would like to ask the professor if there is any way that these reports could be made directly from the mountains to us here, without sending them into the Washington office first? It is too much like the New York & New England railroad was several years ago; they had headquarters at Boston, and all orders and reports were made from and sent to headquarters. The result was that a great many accidents occurred on the road, until it came to be known as the New York and Near Eternity railroad.

SWEZEY—I do not think there would be any great gain in this. The rapidity with which these reports are compiled at Washington is

marvelous. This is done in a very few minutes, and the telegraph being put in use, it is not much longer to send the reports there than it would be to have them sent directly here.

CANFIELD—I have never raised apples, except from the cellar to the third floor. You speak of this as being voluntary; do you mean that they all have instruments alike, or do they buy their own?

SWEZEY—Most of them have Green's thermométer. I would not make much difference between any ordinary thermometer with a long stem and Green's. They have to be tested by some standard thermometer to see how much they vary, and after that it is an easy matter to tell by subtracting or adding the variation, just what is accurate. I think next year we will contract for enough thermometers to have one in each county in the state. Most of the observers have a simple rain gauge and an ordinary thermometer; the thermometers have usually been tested by a standard thermometer. We always count that common thermometers are not trustworthy within four or five degrees.

CANFIELD—Now that you have tested the thermometers, have you tested the observers?

SWEZEY—We can tell by the looks of a report whether or not it is accurate.

CANFIELD—I notice in the reports of one or two observers that whenever it rains it rains "awful hard."

SWEZEY—These reports are nearly all verified. In the matter of rainfall we take a blank map and mark on it the figures of the different reports; you can tell almost in a moment whether there is something wrong with any report. We take great pains with it, and where something looks too large we look it up before allowing it to appear on the records. Our reporter at Tekamah, for instance, reported last summer a fall of eighty inches of rain; we looked it up by sending over into Iowa for reports, and we found that they had had the same amount just across the river, so we concluded our reporter was right.

CANFIELD—Do you think these crop bulletins are more benefit to the farmer than to the grain speculator?

SWEZEY—I could not say as to that. We intend to make crop reports, or bulletins, next summer showing what has been done in other states. It is sometimes good to know that others are in as bad shape as we are. The more intelligent a farmer is the better he will get along.

CANFIELD—I presume that is on the same principle that we, being sick with scarlet fever, should feel better to know that our neighbor had the smallpox. I can testify to the accuracy of these reports. Professor Swezey is far too modest about telling the good this Nebraska Weather Bureau is doing, and I have been asking him questions in order to draw him out.

SWEZEY—We can mail these bulletins to any person who applies for them. Of course, we cannot say that we will mail to all who apply, but we will use our judgment as to where to send them. Those who want reports should address "Observer, Crete, Nebraska."

PRESIDENT—This is a valuable topic; if you want to ask the professor any questions please bring them up now.

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## WHY SHOULD FARMERS PLANT COMMERCIAL ORCHARDS?

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BY G. A. MARSHALL.

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The best way for us to tell if farmers should plant commercial orchards, and if so why they should, is to compare the outlay, income, and net proceeds of general farming, with the income, outlay, and net proceeds of commercial orcharding. We will take a series of twenty years and follow both branches of business from the first to the twentieth year. Some may think twenty years a long time for one to stay at one place and work for an expected gain. But, as we look around us, we find that our thrifty and prospering farmers do not shift about but remain in one place and pride themselves in building up and beautifying their farms. They are always studying and planning the way to make the most money from their land and labor and to so manage their work that they will not be rushed at some seasons, behind at others, and out of work and standing with idle hands at other times. The average farmer is often puzzled, yes embarrassed, at the amount of grain, hay, etc., that needs his immediate attention and must have it, or loss is certain. He must grow all the grain and stock that he possibly can, as he has no other income and he is at an expense all the year.

We will take a commercial orchard of twenty acres and see how this will fit into the economy of life on the farm. The planting of the trees is about all the work the orchard must have at a certain and busy time for the farmer. The ground can then be planted to corn or some other cultivatable crop and will pay its way until the orchard is five or six years old—the time when the trees ought to be fairly started into bearing. The soil must then be sown down to red clover and mowed two or three times a year, the hay being allowed to remain on the ground. The ground should be plowed up once in four years to prevent a stiff sod from forming, then seeded back to clover at once and handled same as before. But the farmer can do this mowing and the pruning, and in fact all the work the orchard needs, at odd times, and will grow just as much corn, wheat, and oats—just as many hogs and cattle as though he had no orchard.

The average farmer, from his 160 acres, after hay and grain for his work horses are kept out, will sell \$800 to \$1,000 worth of grain and stock per year, and after necessary expenses for living, repairing of stock yards, pasture fences, sheds, cribs, and machinery are deducted he will have from \$300 to \$500 left. Now this is the way the successful farmer gets along; the unsuccessful one is way behind this. But we will not take into consideration any but the successful one, and we will suppose that he clears \$500 each year. At the end of twenty years he will have \$10,000 laid up for a cold day.

Now we will figure on the 20-acre orchard. The fruit grower should plant the longest-lived winter apples 33 feet apart each way. He should then double this by planting the short lived varieties midway between the trees east and west. The trees will then stand 33 feet north and south by  $16\frac{1}{2}$  feet east and west; he should then plant of the last mentioned varieties one tree in center of space between each four trees. This tree will stand about 19 feet from each of the four around it. There will then be 155 trees to the acre, or 3,100 trees on the 20 acres. He can purchase and plant the trees at an expense of \$400 or \$500 at the most. The expense from this on will be very light, for as I said before, the work of caring for the orchard can almost invariably be done at odd spells. In twelve or thirteen years he will find the trees crossing their limbs. Soon after this the side branches of the short lived trees should be cut back, using clippers, so as to give sufficient room for the other trees. This should be re-



peated as needed. He need not fear to disfigure these trees as they must come out when they have been planted fifteen to twenty years, according to location and space. However, the more they are disfigured by pruning the more courage he will have to take them out at the proper time. This clipping of the side branches of short lived trees must not be neglected, as it will not reduce the apple crop and the trees intended for the permanent orchard must have sufficient room to develop. I think the proper time to remove the trees is about as follows: one-third in sixteen years. This one-third is the short-lived trees in the permanent rows running east and west. Then in twenty years remove all short lived trees which remain. This leaves the long lived trees only, and they will stand 33 feet apart each way, about the proper distance for a twenty-year-old orchard. Now let us consider the results by making the estimate low enough that it may be depended upon. Starting in with 3,000 bearing trees, and estimating the price of fruit at its value on the trees, we estimate that the orchard will produce as follows:

Sixth year, $\frac{1}{2}$ bushel per tree, at 50 cents .....	\$750
Seventh year, 1 bushel per tree, at 50 cents .....	1,500
Eighth year, 2 bushels per tree, at 50 cents .....	3,000
Ninth year, 3 bushels per tree, at 50 cents .....	4,500
Tenth year, 4 bushels per tree, at 40 cents .....	4,800
Eleventh year, 5 bushels per tree, at 40 cents .....	6,000
Twelfth year, 5 bushels per tree, at 40 cents .....	6,000
Thirteenth year, 5 bushels per tree, at 40 cents .....	6,000
Fourteenth year, 5 bushels per tree, at 40 cents .....	6,000
Fifteenth year, 5 bushels per tree, at 40 cents .....	3,000
Sixteenth year, 5 bushels per tree, at 40 cents .....	6,000
Total .....	<u>\$50,550</u>

Now the time has come when about 750 of these trees must come out, and allowing 250 trees for dead ones, which is a big allowance, however, we have 2,000 trees for the next four years, producing as follows:

Seventeenth year, 6 bushels per tree, at 40 cents .....	\$4,800
Eighteenth year, 6 bushels per tree, at 40 cents .....	4,800

Nineteenth year, 6 bushels per acre, at 40 cents.....	\$4,800
Twentieth year, 6 bushels per tree, at 40 cents.....	4,800
	<hr/>
Total .....	\$19,200
	50,550
	<hr/>
Total received for apples on tree .....	\$69,750

We have forty trees per acre left, or 800 trees that will net at least 2,000 per year for the next ten years.

Some of my friends may say these trees are set too thick, and at the end of twenty years the remaining forty trees per acre will not be as vigorous as if no other trees had been planted among them. I beg leave to differ with them, especially if these short lived trees are headed back properly and taken out at the proper time; and the orchard kept up by the red clover process above mentioned.

But as we limited our time to twenty years let us go back and see how our figures compare. Deducting \$10,000, or \$500 per year allowed for extra expenses, we have \$59,750 from orchard. Adding \$8,000 net gain on balance of farm, we have \$67,750. For the productive varieties adapted to this climate the above estimate is not beyond possibilities or probabilities or even large. But to be sure we have the figures low enough let us cut it down one-half; we then have \$37,865 net proceeds on farm with 20-acre orchard in twenty years. Now as we go back to the income of the successful 160 acres, which is \$10,000, we will say at once that the orchard income is too great to be possible; yet all I have to do to confirm my belief of the above figures, is to look at the following results in my own county: J. A. Miller, of Arlington, has Winesap and Ben Davis trees fifteen years old that have netted him an average of \$5 per tree for eight years. This little orchard of less than 100 profitable trees nets him more than forty acres of any other part of the farm.

As we go north from Arlington a few miles we find an orchard of about 1,000 ten year old trees which netted its owner \$1,500 last year and \$1,600 in 1890. The owner says that this orchard nets him more than the balance of his 480 acre farm. This orchard has but very few profitable varieties in it, being nearly all summer apples. Mr. Beam, of Admah, planted 200 trees thirteen years ago, and in 1890 he picked 1,400 bushels of fine apples from it which sold for more than \$1,000.

There are several orchards in the county that yield from 2,000 to 4,000 bushels per year. Yet we find very few trees of the profitable varieties in those orchards. It is nothing uncommon for twelve or thirteen year old Ben Davis, Winesap, Janeton, or Walbridge to bear ten or twelve bushels every other year and from five to ten bushels the alternate years.

I visited a few orchards in western Iowa this fall, among which was that of L. A. Williams, of Glenwood. There are 2,500 bearing trees in this orchard and it yielded about 10,000 bushels last year. They were all sold but one car load when I was there, prices for winter apples, forty-five to sixty-five cents a bushel. He has about sixty-five acres of fruit which yielded \$6,000 worth of fruit last year. Mr. Williams remarked that the fruit of Mills county brings into the county more money than all of its other products together and that they could compete with the world in the production of salable apples. Mr. J. C. Randall, of Hamburg, Iowa, planted forty acres to orchard eighteen years ago. One-half of the trees proved to be worthless, the other half nets him about \$4,000 per year. He recommends the planting of two year old trees, all winter varieties. I conversed with a number of farmers and they all talked the same way, and assured me that Iowa and Nebraska was the place to grow apples for market. Part of them were inclined to think the business is more profitable in Nebraska than in Iowa on account of prices. Eastern apple buyers jump at the chance to get western Iowa and eastern Nebraska apples as they are as salable as any apples that reach the eastern markets.

After taking all this into consideration, then glancing over the above results, facts, and figures—then over the gloomy outlook in the way of prices on grain and stock—thence over these broad acres of fine orchard lands—I say most emphatically, plant commercial orchards.

#### DISCUSSION.

FOLLETT—I would like to make a few remarks in regard to this paper. It does me good to see young men taking part in this good work. There is one thing in this young man's paper that I would like to object to—and that is close planting. It is not at all a surprise to me that people should fall into this error, especially when such veteran fruit growers as Mr. Williams and many others have planted their orchards too close. I have done the same thing myself. What

would you think to see a farmer planting corn as close as he could easily, and then to fill up the ground, go and plant between a sort of early corn that would ripen earlier and be gone before the other is ready to be harvested? You would say that man is crazy. If you plant apple trees less than thirty feet apart you will make a failure of it. Several years ago I bought an orchard that had been planted sixteen feet apart; for a few years at first it bore fairly well, but as soon as the roots began to get together, those trees quit bearing. I cut out every other tree, making them thirty-two feet apart. That orchard does not bear to-day. I cannot get more than one-half bushel from the Ben Davis trees—a very poor yield. On other Ben Davis trees near this orchard, and trees of about the same age, we picked three to five bushels of apples per tree. I just bring this up as an illustration of what crowding apple trees will do. You will notice that a tree that stands out alone generally bears well. One trouble in crowded trees is that they do not get enough sun-light. In that orchard are three Haas trees near the outside, where they get plenty of air and light; they bore from three to five bushels, while the other trees further in did not average a half bushel. Even after we thinned out the orchard it does not bear. I will have to take out the rows corner-wise, making them forty feet apart. In regard to clover in an orchard, that is correct; it is a good thing. Take the hay off; it won't hurt your orchard. Don't force your trees too fast; they will not properly ripen their wood, and winter killing will result. I find in our country you can force them much too fast. The best bearing trees I have to-day are the ones I held back. I just rise to make this point, and if I have made any suggestions that may be useful to you I am glad to know it.

DUNLAP—How about putting hogs into the orchard to keep down the weeds?

FOLLETT—I am a “hog” man; if you call that being tired, I want to be tired. It is a good plan. When the first lot of apples begin to fall, I turn in the hogs to clean them up. I always turn the hogs in in the spring; do not see that they tramp up the ground much; however, I do not let them run in there when the ground is soft after rains. Regarding spraying, I am not in favor of it. Where it first started, they are now reporting unfavorably. I am at sea in this codling moth business; I can reduce the plague somewhat by using molasses and vinegar in cans tied up in the branches. You can catch the

moths in great numbers in that way. Heretofore they would commence early in the season and stay all along; but last year they stayed but a short time; were gone quite a while and returned. I lost about 2,000 bushels of apples from effects of the codling moth. The last time they came it was like a shower of locusts. Every year there are new developments. You fellows who believe in spraying, just follow it up; I don't believe in it, but if you can find anything that will kill them, I say, "Amen." I think that you cannot do it. I thought a year or two ago that I had it down fine; I knew all about the habits of this codling moth; but last summer when I saw a full fledged moth come right out of an apple, it knocked all my former notions on the head. Riley says that the moth lays eggs that hatch out into grubs; that these grubs, after eating all summer in the apple, go down into the ground, are transformed into a chrysalis, and in the spring come forth a full fledged moth. The one I found changed my ideas in regard to it.

—Do you think hogs would be good to keep down the codling moth?

FOLLETT—I have found the trees just as badly affected where there were hogs as where there were none. If you have enough hogs to eat all the fallen apples you will kill just so many of the moths. The moths in the apples will be eaten by the hogs, but not otherwise.

GOODRICH—Does this gentleman wish to show that cultivation is the best for an orchard?

FOLLETT—Yes, sir; I have all the necessary tools to work my orchard. If your orchard is not worked it will get "hide-bound." I would like to ask in regard to varieties; Benton Aldrich tells me that the Jonathan does not do well on ridges, but must be planted on heavy soil.

DUNLAP—I know of an orchard on sandy soil in which the Jonathans bear well.

FREDENBERG—My acquaintance with Mr. Aldrich is enough to make me place confidence in what he says. I find invariably that the Janet does better on a heavy soil.

CARPENTER—There are several other varieties that also do better on heavy soil.

SMITH—My Jonathan in nursery row do well. We have no

blight, but about half of my trees are sickly looking; part are all right.

FOLLETT—It may be aphid.

SMITH—No, it is not aphid; there will be a tree here and there that is not doing well.

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## COMMERCIAL ORCHARDING IN NEBRASKA.

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BY E. F. STEPHENS.

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The glowing stories of marvelous crops of fruit in California have often appealed to fruit and money loving people to move to her sunny clime and engage in commercial orcharding. No doubt fortunes have been, and will continue to be made from fruit growing in that favored land. They, however, suffer more from destructive insect pests than we in Nebraska.

The growing of fruit in our state has had its trials and disappointments, and we have not yet surmounted all the difficulties that beset us. Enough now, however, is known to make the growing of fruit on a large scale a safe investment for capital. We now know what kinds of soil, exposure, and varieties give best results; when and how to plant; and expensive experience has demonstrated what not to grow, as well as what is only moderately profitable. We know that certain varieties are very likely to blight, and discard them; that other varieties otherwise desirable are not hardy; that some suffer more than others from sun scald; that certain varieties, healthy and productive, are not as salable as others. Many of the older orchards suffer from all of the above causes. We now know what to plant to suit our peculiar conditions, and how to cultivate and train to establish a good orchard at moderate expense.

The expense of caring for a commercial orchard the first ten years, until in fair bearing condition, was rated at \$75 per acre; now, by judicious management and proper selection of varieties, an orchard can be brought into profitable bearing for half that sum. Instead of being contented with a yield of 200 or 300 bushels of apples to the acre, we find it possible to secure above 1,000 bushels from a single acre in one season. In 1889 one variety of apple yielded by measure at the

rate of 1,500 bushels per acre, and sold at eighty cents a bushel. We are now marketing apples that are yielding at the rate of over 1,000 bushels per acre, and selling them at a net price, after paying the freight, barrels, and picking, of sixty cents per bushel—a clear return in one season of \$600 per acre over and above all expenses. A number of varieties are yielding at the rate of 500 to 800 bushels per acre. It is not uncommon for trees ten to twelve years planted to yield ten to fourteen bushels to the tree. To secure the best results, choose healthy, productive varieties, showy rather than of the choicest character. Cultivate fairly to secure vigorous growth, and when in bearing, spray to destroy the codling moth.

The cherry proves to be profitable when well handled, and as they are planted about two hundred trees to the acre, the profit is very fair. Trees ten years old yield from one to one and one-half bushels each.

The growing of small fruits is profitable in a limited way for home or near markets.

I am in receipt of a letter from J. M. Russell & Son, Wymore, under date of July 27th, in which they say they are shipping 400 to 600 baskets of peaches daily, and can hardly see that they have made an impression on the orchard. As these baskets hold about a peck, and average a net return of fifty-five cents per basket, the crop will easily pay the entire expenses of growing the orchard, marketing the fruit, and pay a handsome price for the land besides.

We have the marked advantage over California that while they must seek a distant market at an expense of \$200 to \$400 per car (for freight), our markets are reasonably near at hand, and can be reached at much less expense. Having lived five years in California, and given the question some study, I am convinced that I can do better in Nebraska.

#### DISCUSSION.

DUNLAP—What will you do when your orchard is worn out?

STEPHENS—I do not know how long it takes an orchard to wear out; it certainly takes a good while. Before it gets too old, I would have another young orchard coming on to take its place. Ben Davis, Winesap, Missouri Pippin, and Janet are all good trees for commercial purposes. Jonathan is hardly good—it drops its fruit too easily. Duchess is best for summer. The Early Harvest is doing well.

Cherries should be set  $12\frac{1}{2} \times 16$  feet. Mr. Philleo can tell us about the Wealthy.

PHILLEO—My Wealthys have been bearing ever since they were four years old.

STEPHENS—The Otis Red Streak is another good apple; it ripens in September. Utter's is another good one. Dominie blights badly; I have a few trees of it. When you come to talk blight, you are in the same condition we were in Iowa a few years ago. I have noticed that blight is bad wherever the Transcendant crab is growing. I think we should discard it altogether. For a November apple the Grimes's Golden Pippin will sell for the highest prices. My traveling around has given me one advantage in commercial orcharding—I can sell many bushels of summer apples, because I know right where I can place a few barrels here and a barrel there, and so on.

PHILLEO—Mr. Stephens spoke something about cultivating a crop in his orchard set  $14 \times 28$ ; would he kindly tell us what he raises in his orchard?

STEPHENS—In the summer you can raise vines, sweet corn, etc., between the rows; it gives the orchard cultivation and you make something from the crop besides. Formerly I thought that rabbits liked sweet corn in preference to apple trees, and I left the corn on the ground for them. I lost a good many trees in making the experiment. We now tie up all the trees, and then let the rabbits run.

PHILLEO—I think it is a mistake to suppose that you can make anything by planting corn in your orchard; I fail to make any money by raising corn in the open field, and you certainly cannot make any more where part of the ground is occupied by trees. I think it is a good plan to cultivate your orchard just as you would any other crop, but put nothing else in it.

STEPHENS—In regard to the production, I think you will have no trouble in selling all your apples. The more apples that are used every year, the larger the demand for them next. I find the Salome to be a healthy tree, and the fruit a long keeper. However, I do not think we should lay so much stress on long keepers as we did formerly; we have so many good summer apples, and good facilities for transportation, that a shriveled up last year's apple will not sell with them on the market.

MARSHALL—I believe in level orchard culture.



## AFTERNOON SESSION.

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LINCOLN, NEB., January 13, 1892.

Called to order by President Taylor.

BARNARD—I would like to ask the consent of the Society to hear at this time the reports of the Experiment Station Directors; what they have, what they have done, how the stock did, and so forth. I would ask the unanimous consent of the Society to bring this up the first thing to-morrow morning.

BESSEY—I have one little matter: The State Historical Society, by their rule, meets when our Society does. I have been consulting with men in this Society and find that we have quite a number who would like to be able to join and visit the Historical Society if it did not meet at exactly the same time that ours does. I have prepared a preamble and resolutions to present to that Society, asking them to change their days of meeting, if possible, as ours is fixed by law:

WHEREAS, The meetings of the State Historical Society occur at the same time as those of the State Horticultural Society; and

WHEREAS, Many of the members of the Horticultural Society are interested in the work of the Historical Society; Therefore, be it

*Resolved*, That we respectfully call the attention of the members of the Historical Society to this unfortunate conflict in the hope that such change may be made as will prove of mutual benefit.

I move the adoption in order that it may be given to the Society this evening. I think that Society can change the time of its meetings so that it will meet Thursday and Friday nights, and our members could attend without any trouble. It seems to me that it would be very desirable for us to meet with them.

BARNARD—How about the time of meeting? Is not their time fixed by law the same as ours?

BESSEY—I do not think that they are tied down as we are. Adopted.

# APPLE-GROWING IN NEBRASKA AND ITS RELATIVE VALUE AS A SOURCE OF INCOME AS COMPARED WITH OTHER INDUSTRIES OF THE FARM.

BY J. H. MASTERS.

*A Partial List of Fruits Grown and Sold in Otoe County, Nebraska,  
by J. H. Masters.*

## APPLES.

Morton Produce Company.....	11,000 barrels.....	\$16,500 00
Jno. Steinhart & Co.....	10,000 barrels.....	15,000 00
McElheney & Co.....	7,500 barrels.....	10,750 00
Reed.....	1,200 barrels.....	1,800 00
York & Brown.....	6,000 barrels.....	9,000 00
C. H. Williamson.....	6,200 barrels.....	9,300 00
J. Lloyd.....	800 barrels.....	1,200 00
Paul.....	2,000 barrels.....	3,000 00
Berlin.....	650 barrels.....	1,050 00
Delta.....	2,217 barrels.....	3,325 50
Julien.....	1,750 barrels.....	2,625 00
Talmage.....	2,775 barrels.....	3,412 50
Syracuse.....	10,000 barrels.....	15,000 00
Burr.....	520 barrels.....	780 00
Turlington.....	15 barrels.....	22 50
Unadilla.....	325 barrels.....	487 50
Total.....	67,652 barrels.....	\$101,253 00
J. H. Masters.....	85 barrels.....	127 50

## SMALL FRUITS.

Strawberries, 206 cases, at \$1.25.....	\$236 50
Raspberries, 268 cases, at \$1.25.....	325 00
Blackberries, 302 cases, at \$1.10.....	332 20
Cherries, 1,669 baskets, at \$1.25 per bushel.....	347 50
Grapes, 1,683 baskets, at 20c. per basket.....	336 60

Plums, 146 cases (16 quarts) at \$1 per case.....	\$146 00
Currants, 132 cases (16 quarts), at \$1 per case .....	132 00
Pears, 60 cases, at 50 cents.....	30 00
Peaches, 52 cases, at 50 cents.....	26 00
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Total .....	\$1,911 80
Morton Produce Company.....	3,820 00
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	\$5,731 80
Apples.....	101,253 00
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Total.....	\$106,984 80

While I am up I would like to say just a word or two in regard to the methods by which we increase the profits in our orchards. I know that we have a good many "non-pruners" in this society. I am decidedly in favor of pruning, and I find where I do the most pruning, in a proper manner, of course, that I have most and best fruit. We not only want to do good pruning, but we also want to manure our trees. Any one who has not tried it has no idea what a good effect it has on the orchard. Five years ago I had an orchard that had been seeded down to grass. The fruit kept getting smaller every year until it was not fit to make cider of. I put nearly a hundred loads in the orchard—about two loads of manure to every six trees. As soon as vegetation started I spread this manure around to within, perhaps, two or three feet of the trees. The result was that I had the prettiest Winesaps you ever saw. This last year the apples were not so good. The effects of that manure of five years ago is wearing off, and I shall have to put some more on. I used just ordinary barnyard manure. I would prefer to have it pretty well rotted. I always commence pruning as quick as the leaves are off in the fall. Prune pretty close with chisel. I use a can of paint and cover up the wound just after the branch is cut off. I follow up that course at intervals until the buds begin to swell in the spring. Would not object to using mineral paint, but would to the iron paint. There are two reasons for pruning in winter: First, because one has more time to do it than at any other season. Second, the trees are in a dormant condition. By pruning at the time when the trees are dormant, bleeding will not result. I commence just as soon as the leaves are off in the fall and

continue until the buds begin to swell. Ashes are good to put on the ground in an orchard, but not so good as manure. I believe I said that I do not prune when the limbs are frozen; the only reason for this is that you can prune a tree in that frozen condition and kill it. Besides, the twigs and branches are more easily broken, and you are apt to break off limbs that you do not want removed. My objection to heavy pruning is that you remove a large portion of the leaf-bearing capacity of the tree, and by thus shortening its resources may cause it to die.

Two important things in fruit growing should not be overlooked. We must find some way to get away with our injurious insects. The codling moth is the worst one we have to deal with. The only way I know of to get away with it is to spray the trees with London purple or Paris green. Spraying should commence about the time when the apples are about the size of hazelnuts, while they are still pointing upward. Do not wait until they drop downward. Spray again in two weeks, and I would almost be willing to warrant ninety per cent of your apples to be free from the codling moth.

In selecting and packing fruit, no fruit grower can afford to let his reputation go down as a good packer. Every man must make a reputation for his fruits; by and by he gets a reputation so that his name on the barrel is enough to warrant the entire lot. Another item, as to the selection of varieties for the western market; you must use a different list than that for the eastern markets. For the west the Ben Davis does first rate; but when you ship it east they say, "It is a nice apple; it is nice to look at; but we cannot eat it." In growing for the east we want a list that looks well, and tastes well. Send a green apple east and it will not sell, unless it were a Rhode Island Greening. They would very soon spot you if you claimed that, and it was not. I will take the Otoe in preference to any other for an October apple. Jonathan and it are about the same quality. It is an apple of much more tender texture than the Jonathan, and will not keep quite so well.

## DISCUSSION.

**BARNARD**—Is it your experience that wholesale dealers will take Ben Davis in preference to Winesap?

**MASTERS**—Yes, sir; I will tell you why western buyers want Winesaps; they have bought down in Kansas all the Ben Davis they

want. I believe the more apples we have, the bigger market there will be for them. It is like the old saying, "Where the carcass is, there you will find vultures." When two or three buyers come to see my apples I think, "Now, I will get a good price," and I most always get it. It is very little use for one man to spray to kill the August crops of the codling moth; but if you can get your neighbors to help, you can do a great deal towards it. The codling moth has a pretty keen scent; it can smell apples a good ways. The moth leaves the apple before it turns downward. I do not believe you can find one codling moth in a hundred apples. Hogs in the orchard do not have much effect in the matter of killing the codling moth; it has gone before the apple falls.

—How about catching the codling moth with vinegar?

BARNARD—The idea that they cannot be caught with vinegar is a mistake; they can. When it begins to ferment they will find it. I will tell you what you can notice when you make cider in the fall, you will find codling moths all over the pomace. Sweetened water has no attraction for them, except after it begins to ferment.

LAING—I have caught them in sweetened water.

MASTERS—I use one pound of honey water to about the same amount of cider vinegar. I very seldom catch any the first night; the second morning, two or three; the third morning, probably twenty; the fourth morning it would be full of them. I strain this water and put it back, as it is far better than the fresh. I keep this up.

—Do not you catch them after they have done their mischief?

MASTERS—No; it is the habit of all insects to fill themselves up while their eggs are forming.

—What about gathering the apples about the time the eggs hatch, and running them through a cider mill?

MASTERS—No; these are apples that have failed to fertilize; and there is too much trouble attached to it. You can kill them in various ways.

STEPHENS—It is somewhat of a general topic. In regard to profits, I am satisfied that we have conditions of success, so that a large acreage in the future will be set out. We have experimented until it is known that men may plant freely, with a just cause for supposing that they will get fair returns for the money invested. I believe capitalists can plant orchards now, feeling sure they can get

good returns. The experience of our old members—such men as Masters—is a good guide; we should start right. Regarding the matter of experimentation, the man who has not had the time to go through the many trials attendant upon experimenting may now go quietly to work and plant out his orchard with full expectation of making a success of it; by carefully looking over the successes and failures of the old-timers. Plant on the best ground you have. In the districts west of this there is something to be gained by subsoiling the ground. I have found it useful to plant 28 feet apart; and further west that may be reduced. In the west the winds blow so strongly that trees do not grow so large as further east. We subsoil about as deep as we can with six horses. We like to prepare our ground in the fall, as it mellows the subsoil. The soil along the Blue river is considered drift and loess mixed. We have found some difficulty with summer winds when the fruit is set on the trees. We like to have a wind-break on the south and southwest. These are to protect from the drying southwest winds. Regarding close planting it is all right to plant them pretty close, if there are part of them cut out at the proper time. It is so easy to say, "That is a very pretty tree, and I hate to cut it out." If a man has nerve enough to remove them at the right time it is all right. The tree to use for these trees to be cut out early is the Duchess of Oldenburg, a very upright grower. The Missouri Pippin, which bears when young, is another good tree to plant for early removal. When I find that the trees are exhausting the ground, I manure heavily. By free use of manure, I believe, we can counteract the double-cropping of the soil. With these methods we have raised on Duchess of Oldenburg, forty trees—one-fourth acre, 280 bushels of picked apples, which sold at eighty cents per bushel. In the same way Plumb's Cider yielded at rate of nine bushels to the tree, set twelve and one-half feet apart in the row.

My trees are on a rich piece of ground, and for quite a number of years the apples were of fine appearance and size; however, they began to grow smaller nearly every year. Being planted about twelve and one-half to fourteen feet apart, I saw that they must be thinned out, which I began to do last year. I am satisfied that up to fifteen or sixteen years of age, we can increase the profits by double cropping.

Regarding insect enemies, this is the worst form of pest that we have to deal with. However, I am convinced that we can overcome the codling moth by spraying with arsenical solutions. We use one pound of London purple to 250 gallons of water. You can spray 2,000 trees per day by using a good spraying pump. We like to commence spraying as soon as the apple is formed; just before it turns down is one of the best times to do this. Do not wait too long, as it is not nearly so effective after the apple hangs with the blossom end downward. Neither must you spray too early, or before the apple is formed, as this will kill the bees.

I think Mr. Masters' suggestion in regard to marketing apples was a good one. There are a great many difficulties in marketing apples and keeping up a reputation. To get the best prices; the best railroad rates; to lose as little as possible—all these points are to be considered. My practice has been to avoid commission men as much as possible; they have no direct interest in getting the most out of your consignment. The last season we have shipped 3,500 bushels to the Black Hills; it cost us \$265 per car load for freights; that is a very heavy rate, and we shall be on the lookout for such in the future. I have avoided shipping to Denver or Missouri, because there the prices are lowest. Our policy has been to call out the local markets, and have only one profit between the local dealer and the consumer. You must keep up an active correspondence with your customers, as by doing this you are enabled to get good prices for your fruit. Our best winter apples have brought us very satisfactory prices. I am satisfied that in order to go into commercial orcharding to win, that we must have a cold storage house. The larger the storage house, the less your storage costs you. We have a wide market west, and a good market northwest. When the B. & M. R. R. is completed through to Montana, it will open up a good market for us in that country; one that I believe will be very valuable for us.

In regard to the matter of grading, we must have fruit of the same quality all the way through. If you are shipping to distant markets, the best must be sent. We usually make two grades: the very best, and the second grade; the culls are made into vinegar with profit. We sell but little vinegar for less than eighteen cents per gallon.

About the cold storage house, I think one after the plan of those in western New York—air ventilation—is the cheapest we can put up;

and one of the best. These are built in side hills; the doors are kept closed when the air outside is too warm, and open in the evening when sufficiently cool. Fruit thus stored will keep longer than that stored on ice. I think that this covers most of the points in my experience.

BARNARD—Do you not think that as a rule people are excluding the earliest apples from their lists?

STEPHENS—I think that is a good point to consider. There are some things in that that should be studied. You can have too many early apples, unless you know how to get rid of them. I have been very successful with Utter's Red; some of the best trees bear three barrels. Our Duchess of Oldenburg we commenced marketing the 10th day of July. I believe if a man is going into commercial orcharding, he should grow at least a car load of apples to market at once; the freights are much cheaper, and usually he can dispose of them with a less percentage of expense. I believe there would be money in selling the Duchess in Minnesota and the northwest, but one must needs have a car load to ship at once, in order to save freights.

—Have you tried putting up apples like oranges are, wrapped in paper?

STEPHENS—It would not pay for our western markets. I have found that men will not give me enough more for Jonathan over the price of Ben Davis to justify me in growing it largely. Concerning cider vinegar made from wormy apples, it is surely better than acid vinegar; no matter what kind of apples you use there will be some wormy ones in the lot. I believe to make a market for your vinegar you must push it—rustle it; if you do that you can get good prices for it.

—Do you think that leaning an apple tree will shelter it?

STEPHENS—I guess it is a good thing to lean an apple tree a little to the west of south when you set it out; it prevents sun-scald to a certain extent. We wrap our trees to keep off the rabbits.

—Do you advise men to plant trees so when you advocate planting?

DAY—Your trees look so odd set that way; does this pay for the queer looks?

STEPHENS—I do most anything to protect our trees in the western part of the state, no matter how odd they look.



—With us, trees fifteen years planted, and twenty-eight feet apart will have the tops touching.

STEPHENS—I am satisfied that your soil grows trees much faster and larger than farther west in this state.

BARNARD—Speaking of manure, we have had some experience with that. We find that we can tell by the crop of fruit just how far the manure has been put. By manuring you get better apples, better quality of fruit, larger ones and more of them. I put the manure a good ways away from the tree trunk, for the reason that the small roots—the ones that take up food for the tree—are far from the main stem. I have noticed also that trees with spreading branches hold their fruit much better than those crowded.

GOODRICH—In regard to the protection of a small tree from wind and sun, would not you recommend a hedge in preference to another small tree twenty-eight feet distant, even if that tree were set in a row toward the 1 o'clock sun?

STEPHENS—In 1873 I planted out a lot of high-headed Illinois trees. In the spring of 1873 I bought of Samuel Barnard 1,100 two year olds, headed rather low; I lost but five out of the Barnard trees and most of them are in very good shape yet.

SLAYTON—Cannot we combine the advantages of planting close and planting wide, by planting thirty-three feet apart east and west, and twenty-four feet apart north and south?

CARPENTER—Mr. Welhouse, the great Kansas orchardist, planted his first orchard fifteen by thirty feet; he now plants fifteen by thirty-two; has a six hundred acre tract planted all to apple tree and says if he had ten thousand acres to plant they would all be the same distance. During August I visited California. The tendency there is now to head back. Their trees are so low-headed that they look like great bushes instead of trees. I visited the largest orchard in the United States, the Bidwell orchard at Chico; there are 2,800 acres and every tree was headed back in the same way. I asked the reason for this and the manager told me that one man standing on the ground could pick at least four bushels while another was picking one from a ladder; the main object is to save labor. In the fruit I noticed but very little difference in that near the ground and that near the tops of the trees. I forgot to mention that this severe pruning was not carried out on every variety of fruit; for instance, his Royal Anne cherries

would not stand severe pruning, and, consequently, were left as before. I head my cherries back here, to save labor in picking, never allowing them to get much more than eight feet high; the limbs start eighteen inches from the ground. Have an idea that I will try that on apple trees here. Our Colorado orchards will be trimmed the same as those in California.

STEPHENS—I saw apples, wrapped like oranges, bring \$3 per box in San Francisco, when oranges would not bring \$2.

MASTERS—When I was in California they did not trim so heavily as Mr. Carpenter speaks of. They then thought it would injure the tree to do so. One of Mr. Bidwell's Royal Anne cherry trees bore 1,970 pounds of cherries one season, and they sold at twenty cents per pound. These trees are a wonderful sight; nearly twenty feet across the head. I saw a good deal of the severe trimming Mr. Carpenter speaks of at San Jose and Santa Barbara.

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## GROWING FRUIT VS. FARM CROPS.

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BY C. W. GURNEY.

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To discuss the *pros* and *cons* between growing apples and other farm crops, compels us to view the subject from two separate points, and to arrive at two separate conclusions: First, to determine whether we can or cannot grow apples at the point where planting is contemplated, with what would, in the large apple-growing states, be called reasonable success. If not, that ends the chapter, but if we decide affirmatively then we tread the shadow of the second question—Is it profitable? Where is our market, and what is the prospective future market value of our fruit? These points being determined, if no mistake has been made the inquirer may proceed without hesitation, and pursue either one or both of these vocations.

The first proposition more nearly approaches a question of fact than one of speculation or argument. However, we can determine nothing positively which belongs to the future. We have raised corn successfully for many years; we have no positive assurance that we shall ever be able to grow another ear. The same is true of every crop produced upon the farm, and if we waited for absolute assurance

of success before planting the orchard, and applied the same rule to all crops, we should invite a famine. J. E. Spier, who lives near Lyons, in Burt county, some years ago considered all these points and planted an orchard of ten acres, which is now in bearing. He states broadly that this ten acres has paid him better and more clear money than the entire balance of his half section farm. He writes me January 4—and I call your attention particularly to his very valuable and practical report—that his Ben Davis have at times paid him as high as \$500 per acre. His cherries at the rate of \$300 per acre. His Duchess bore at the rate of 1,000 bushes per acre, and his Wine-saps and Janets at the rate of 1,500 bushels per acre. These figures he assures me are nearly correct as he “attends to these things personally.”

D. P. Sherwood, of Ponca, in the north of Dixon county, planted an orchard of seven acres about eleven years ago. Later it has been increased to 100 acres. Mr. Sherwood has realized an income of \$1,000 per year for the last two years from these seven acres, and the orchard yet hardly in its prime. In the same county, still further north, is the old L. T. Hill orchard, something like twenty-five years planted. An abandoned farm, neglected, sod pound and grown up to weeds and bushes, the trees still load down annually with beautiful fruit. In this orchard the principal winter apples are Willow Twig, Ben Davis, Janet, and Iowa Blush. Near the center of Madison county lives James Gibbs, who something like twenty-five years ago planted a three-acre orchard. It stands on a sharp south hill slope, open to the east and west, but with an old cottonwood grove on the north and south. In the south row are about a dozed Ben Davis which have borne only as Ben Davis can bear for about twenty years. They are still young looking, sound, thrifty, and productive. I could give scores of just such hard facts for each one of the above, but considering the large extent of territory and widely separated points, and especially this high latitude, they ought to suffice. Speaking of “latitude,” it is up here in this hyperborean region that that eminent, though unappreciated horticulturist with the whole root, from a sister state, advised us to “stick to our Sour Russians and a few crabs, and buy our apples down there.” We don’t have to.

Now for a market present and prospective. From twenty to fifty years ago, as I read the horticultural history of the country in its stand-

ing orchards, large orchards were planted in New York, Michigan, and Ohio, and southern Canada. Fifty to one hundred years ago, I read in the same book, large orchards were planted in New England; that is, they called them large. In the summer of 1890 I made a tour of these states, and I state it as a most surprising fact, one which will test the credulity of any one who has not been over the ground, that there has practically been little orchard planting since those periods. It is true I saw but little of that immense territory, but what I saw was with the eye of a "tree man," watching for young apple trees and young orchards, as no one but a tree man will, and if this is not the case as a great sweeping rule, I surely should have seen some exceptions worthy of notice.

In the town of Cummington, Massachusetts, where I was born and brought up, and where I spent several weeks, I saw but two orchards planted within the last ten years, and together they did not number twenty trees. This was not true of pears. These are quite largely planted. Through southern Canada, New York, and Ohio I saw what appeared to be miles of orchards, but entirely destitute of fruit. I was not surprised when I saw that fall, whole train loads of apples going from Kansas, Nebraska, and Iowa to Michigan, "coals to New Castle at last." Then I said, our market is east and not west, as we have been told so long. East? Yes, "even to the uttermost parts of the earth." We have shipped England alone nearly 1,000,000 barrels of apples during the last three months. Why, those foreigners say we can't raise apples in this country. "Over there," they say, "they have only to stick a sprig in the dirt and it will grow and soon bear a fine crop of apples," "and far better than anything you can raise here, too." But, right in the face of these statements we are bombarding them with ship loads of big western apples.

Some one says, "Gauge the intelligence and prosperity of a nation by its consumption of sugar." I have no statistics by which to prove this, but I believe the yearly consumption of fruit in the United States is increasing in a ratio very much greater than that of sugar, and that it is as good and probably a far better test of the prosperity, progressiveness, and intelligence of a people. You ask why the eastern states have practically abandoned planting young apple trees. Several reasons. I will state but one, for in fact it is all we have practically to consider, and take advantage of. The early planting was over-

done on a new market with a poor appetite. Apples dropped so in price that they did not pay to market and they rotted on the ground, They should, and probably will, see their error and correct it in time. but in the interim, with markets west of us, markets east of us, north of us, across the water, and this growing demand for good apples will be seen, is seen, by our wide awake fellows here in the west, who will reap the reward of success honestly earned.

Gentlemen—Farmers—plant orchards. Plant for profit. If you don't know how to plant and take care of an orchard, how to select the varieties which will return you the greatest income from the smallest investment, and have not the inclination to get to the bottom of it by hard work, either let some one else who does know how make it for you or else touch it lightly. But if your inclination lies in that channel, and you have been a close observer, a reader and a thinker, hit it hard! Inside of ten years there will be some one year in which you will smile to see a single crop return you every dollar of your investment, land and all, and leave you the possessor of a fine annual income "as clear as a crystal."

#### DISCUSSION.

MASTERS—I think this is an excellent paper. It is quite true that the people of the eastern states have practically quit planting apples; many of them plant pears now. In the Boston market you can buy pears for about half what you can get good apples for. The outcome of all this will be that not many years hence we will be furnishing the east with apples. The trouble with their orchards there is that they used long roots.

BROWN—In going through Michigan last summer, on my way to Canada, I noticed more apple orchards than in either Kansas or Nebraska. I think it will be many years before their orchards get so badly run down that we shall be supplying them with apples.

BELTZER—It seems that a great deal is seen while we are going on some trip. I might mention that I went to Boston last year. I noticed a few of the orchards along the road. There were hardly enough young orchards along the road to make mention of. Many old ones. The east will certainly have to look to the west for her apples in a few years more.

HARTLEY—The one thing is remarkable—that we grow better in our theories than in our facts: Michigan has been and is furnishing

us with a great deal of fruit—and she will for a good many years yet. Going through that state one time not long ago, I counted for thirty minutes to see how many orchards along the railroad I could see; I counted 135 orchards in the thirty minutes. In the whole 135 there was not a wholly young orchard—some had a few young trees set out on side, but most of them were composed of all old trees. Undoubtedly the eastern people are not “keeping up with the procession.” That fact will account largely for the lack of planting there. Another thing, they read about those wonderful prairies “out west,” and each has an idea some time he will go out there; the young men say, “I will leave here some time and it will not pay for me to plant out an orchard now;” the old man thinks the orchard will last as long he will, and if Jimmie wants an orchard let him plant out one. It is about the same in New York, Pennsylvania, Illinois, Indiana, and other of the states east of us. We should be careful not to exaggerate about the profits in tree growing. The facts mentioned in this paper may be true; yet we should be careful not to make our stories one particle larger than they really are. The way our nurserymen could get their trees—very cheap—it seems to me that if there were as much profit in this orcharding, so much more than in ordinary nursery business, that all these nurserymen would be out of that and into orcharding. Their trees would not cost so much as for any other person, and in this way they would have the advantage. We should be careful about telling these “Munchausen” stories. The facts are that not one of these nurserymen has quit that business; all are more or less interested in orcharding, but they rely upon their nursery business to bring them in the cash. Of course we are willing to say that there is more profit in orcharding than in ordinary farming; let us say that there is a little more money in orcharding than a good many other kinds of business, but be careful not to tell those “Munchausen” stories. There is getting abroad the report that this is a regular nurserymen’s convention; that we meet here to recommend orchard planting in order to sell trees; that we have trees to sell, and trees we must sell. I believe that the opinions expressed would be believed better if we kept within bounds. My trees have not paid me very well yet; I am not a millionaire yet in apple growing. If all these stories of the enormous profits were true, this room would not hold all the mourners. I have found very few wealthy

fruit growers; usually they are intelligent men who understand their business. I visited an orchard at Troy, Kansas, in October; last year the crop had been sold for \$10,000; this year they would not get one-half that amount for it. The trouble with orcharding is that we cannot tell what our profits are to be each year; one year they will run away up, and the next perhaps will not pay the expenses. A Wichita man sold 750 barrels of apples from 800 Janet trees; the 800 did not bear fifty cents worth the next year.

BARNARD—I wish to reply to some of the gentleman's points in regard to nurserymen going into commercial orcharding: the fact is that any nurserymen would gladly quit the nursery business for that of orcharding, but they have not the capital to let loose of the nursery business altogether and start wholly in orcharding. It costs a great deal of money to start a big orchard, and most of the nurserymen started with little or nothing. It is true that money can be made in the nursery business, and it has been made; but it does not cost so much to begin in the nursery as it does to plant out an orchard. It is folly to ask why the nurserymen did not go into the nursery business in the first place—they did not have the capital.

MASTERS—I am glad to hear Brother Hartley caution us about telling big apple stories; but I must say that the biggest stories I have ever heard told in this Society were told by Mr. Hartley. [Laughter.]

HARTLEY—Well, I must confess that formerly I did tell some of Mr. Masters' stories to this Society. [Laughter.]

MASTERS—I commenced the nursery business as poor as any man could; it has paid me very well, but I make more money now out of my orchard. I could not have started heavily in the orchard business at the beginning as it would have cost too much money—something I did not have then.

CARPENTER—I think Hartley is mistaken in regard to planting commercial orchards; there is sure'y good profit in it, but as Mr. Barnard says, it costs so much to begin with. I came here thirteen years ago, you might say a pauper—I had \$13. I think we often do over estimate the profits in orcharding, but not greatly. This last year I have made \$1,020, gross, from fruit grown on six acres of land; the cost for help amounted to \$455.

HARTLEY—One reason Mr. Masters has been a little more amused than some of the others here is that he got me into this orcharding. I saw that he was making money, and I wanted to do so.

MASTERS—When you planted that orchard did not you ask me in regard to it, and I told you that if the trees were properly cared for you might expect to make a good profit out of it.

HARTLEY—Mr. Masters said that he had about 1,500 trees, and that he marketed enough apples each year so that he got about \$500 or \$600 profits. I believe orcharding will pay better than stock raising or most any other crop. So far as Mr. Barnard is concerned, we know it takes a good deal of money to plant a large orchard, but it takes something to raise even corn.

MASTERS—Mr. Hartley had his estimate made out according to the number of trees to plant; thought he would get five or six bushels per tree. He asked me if it was a fair estimate; I told him that we could hardly make an estimate—sometimes we would get from ten to fifteen bushels, and at other times probably only three.

CARPENTER—I believe we can depend on the east for our market. The census shows that there is an increase in the population and a decrease in fruit growing.

BARNARD—I think that most of these stories come from the fact that a few trees are taken as a guide. Take a small piece of ground, estimate how much the profits would be on an acre, on ten acres, on forty acres, and you have the foundation of a big story. In father's orchard there are some trees that will give good returns every year, and it is a fact that in any orchard planted eighteen years ago there are many trees that are absolutely worthless. They just incurber the ground. I have not seen one commercial orchard that is in shape to figure on; there are always more or less trees that are worthless on account of the variety.

DAY—It is an absolute fact that these large estimates are made from a few trees and then widened out to a large acreage. Mr. Gurney's paper regarding Mr. Spier is pretty accurate. He is a great farmer; keeps blooded stock, everything fine, Poland China hogs, etc. His farm is as thoroughly tilled as any farm in Burt county. This is the basis for a ten-acre orchard. I sold him his first trees, most all of them. It was at an early day, when we knew little or nothing about



trees, and of course there are some poor varieties in that orchard. We have learned a lesson since then not to plant too many summer apples.

WILLIAMS—I think there is good money in raising apples or I should not have quit the nursery business and gone to growing them. I do not think those who have given their estimates have called them too little. It is a bad thing to plant 200 trees to the acre. I think it is a great mistake, and that any one who tries it will find it so in a few years. Our farm lands near Glenwood are selling at \$50 per acre. On the hills near Glenwood lands partly in orchard are selling at \$200 per acre. They are not worth that amount now, but it is in view of the profits that are known to be obtained in the culture of fruit.

DUNLAP—I have been making some figures. Suppose we have an orchard planted at the rate of fifty trees to the acre. Ben Davis trees in twenty years will have borne fifty to seventy-five bushels per tree—say they will make 3,000 bushels for the twenty years, at fifty cents per bushel it would amount to \$1,500, or about \$75 per acre per year. By taking good care of the orchard I think we can safely count on fifty to seventy-five bushels per acre per year for twenty years.

Adjourned.

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### EVENING SESSION.

LINCOLN, NEB., January 13, 1892.

Called to order by President Taylor.

### A SECOND REPORT UPON THE NATIVE TREES AND SHRUBS OF NEBRASKA.

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BY CHARLES E. BESSEY, PH. D.

The following report is the result of work undertaken some time ago by the aid of the State Horticultural Society, and the Agricultural Experiment Station of Nebraska. It is not published as a complete or final report, but as a contribution to our knowledge of the native woody plants of the state. It was first read before the State Horticultural Society in its summer meeting at Hastings in 1891, and after many corrections and additions was published in out-

line in the *Nebraska Farmer*. As a result, a considerable number of additions were made to it through the kindness of correspondents in different parts of the state. It was then published as Bulletin No. 18 of the Agricultural Experimental Station, and widely distributed throughout the state. Again the list received corrections and additions. It was again brought before the Horticultural Society in its winter meeting in January, 1892, for further revision. It is now reprinted in the hope that its wide distribution through the reports of the Society will call still further attention to the study of the native woody plants of the state. While not complete, it may serve as a general guide to those who propose to plant trees upon the plains, inasmuch as it shows what already grows successfully without cultivation.

It is hoped that it will stimulate many to a study of our native trees and shrubs, to the end that a complete account of every species may be written in the not distant future. An earnest request is hereby made for the co-operation of all who love trees, in the endeavor to put on record all the facts which bear upon the geographical distribution of our species.

## GYMNOSPERMÆ.

### ORDER CONIFERÆ.

#### Pine Family.

#### 1. YELLOW PINE, OR BULL PINE.

*Pinus ponderosa* Dougl., var. *scopulorum* Engelm.—A medium sized tree with reddish bark, and a yellow, rather resinous wood. The leaves are from three to five inches long, and are in twos or threes. The cones are two to three inches long, and ripen in the fall of the second year.

This interesting tree, which occurs so abundantly in the Rocky mountains, is the only pine native to Nebraska. It forms quite dense forests in the northwestern and northern portions of the state, extending from the Wyoming line along Pine Ridge and the Niobrara river to Long Pine creek in Brown and Rock counties. It occurs also on the North Platte river as far eastward as Deuel county. In the Loup valley it originally grew in many canyons, and remnants still occur in Valley, Greeley, and Custer counties. It appears to be wanting in the Republican valley.

This is one of the hardiest of the pines. Fine trees occur abundantly upon the sides and summits of the rocky hills of the north and northwest portions of the state. Good trees may be seen in Dawes county, growing in the tough prairie sod, with nothing to protect the trunk or roots from the heat. A study of the tree in its native habitat shows that it requires very little moisture either in the soil or the air. It appears to be one well suited for planting in the central and western portions of the state.

This tree grows in the higher altitudes of the state, ranging from more than 5,000 feet above the sea on Pine Ridge (in Sioux and Dawes counties) to about 2,500 feet on the Niobrara (in Rock and Keya Paha counties). On the North Platte it ranges from nearly 6,000 feet (in Scott's Bluff county) to about 3,500 feet (in Deuel county). In Custer county it grows at an elevation of about 2,500 feet, while in Valley and Greeley counties it descends to about 2,000 feet above sea level.

## 2. JUNIPER.

*Juniperus communis* L.—A low, spreading evergreen shrub, with prickly-pointed leaves, which are in whorls of three; berry dark blue, about one-fourth inch in diameter.

This shrub is abundant in Cherry, Dawes, and Sioux counties. It is always a prostrate shrub and resembles the variety *alpina*, but the leaves are spreading and fully one-half inch long. The Juniper reported from Cass county turns out to be Red Cedar.

## 3. RED CEDAR.

*Juniperus virginiana* L.—A small or medium sized tree, widely distributed throughout the state, particularly in the central, northern and western portions. In the canyons of the high lands in the upper North Platte river region there is a glaucous, smooth-leaved form which in many particulars is quite distinct from the ordinary Red Cedar of the lower lands. It appears to be a desirable variety and has been introduced in some places. In the Wild Cat mountains and other crags in Banner and Scott's Bluff counties it grows as a low, scraggy tree, twelve to eighteen feet high, with a rounded top, and a bright red trunk which is free from branches. It resembles an apple tree in form. Its foliage appears to be smooth throughout, there being few if any awl-

shaped leaves, resembling thus the cultivated Savin. This variety is evidently the same as that found near Pike's Peak in Colorado (*Rydberg*).

I greatly desire to secure fruiting specimens of this interesting variety.

#### MONOCOTYLEDONES.

##### ORDER LILIIFLORÆ.

###### Lily Family.

##### 4. GREENBRIER.

*Smilax hispida* Muhl.—A green, woody climber, covered with black prickles. It is widely distributed throughout the state, occurring in woodlands from the southeastern to the extreme northwestern counties. It makes a pretty, ornamental climber for use on large grounds.

#### DICOTYLEDONES.

##### ORDER AMENTACEÆ.

###### Oak Family.

##### 5. WHITE OAK.

*Quercus alba* L.—A large tree, with strong, tough, and durable wood. Confined to the southeastern part of the state (Cass and Nemaha counties).

##### 6. POST OAK.

*Quercus stellata* Wang.—A small tree with heavy and durable wood. Said to occur in the southeastern part of the state (*Sargent*).

##### 7. BUR OAK.

*Quercus macrocarpa* Michx.—A valuable tree, often attaining a great size. It may be known by the bur like cup of its acorn. The wood is heavy, strong, and hard. It occurs throughout the eastern half of the state, west to Cherry, Custer, and Harlan counties.

This is the most widely distributed oak within the state. In favorable situations it attains a great size, even along its western border. In Long Pine canyon there are trees from two to three feet in diameter, with large and well formed tops. Elsewhere along the western line of its distribution it attains a large size in canyons and river bottoms. In many cases, however, it becomes low and scrubby, especially upon the dry hillsides.

In the southern part of the state the Bur Oak appears not to ascend to a height of more than about 2,000 feet above sea level; in the cen-

tral part it reaches 2,200 to 2,300 feet, and in the north, 2,500 to nearly 3,000 feet. In the Black Hills of South Dakota, at 6,000 feet, it is a small tree ten to fifteen feet in height.

#### 8. YELLOW OAK.

*Quercus muhlenbergii* Engelm.—A fine tree, with heavy, durable wood. Occurs in Richardson county.

#### 9. LOW YELLOW OAK.

*Quercus prinoides* Willd.—A small, shrubby tree, much like the last. Occurs in Richardson county.

#### 10. RED OAK.

*Quercus rubra* L.—A large tree, with coarse-grained wood. Acorn-cup, saucer-shaped. Confined to the eastern part of the state (Richardson, Pawnee, Nemaha, Cass, and Lancaster counties to Dixon).

#### 11. SCARLET OAK.

*Quercus coccinea* Wang.—Resembling the last, but the acorn cups are "top-shaped." Confined to the southeastern part of the state (Richardson and Nemaha counties).

#### 12. SCRUB OAK.

*Quercus ilicifolia* Wang.—A small tree, or shrub, with saucer-shaped acorn cups. Confined to the southeastern part of the state (Cass county).

#### 13. BLACK OAK.

*Quercus nigra* L.—A small tree, with heavy wood; on hillsides in the southeastern part of the state (Pawnee, Richardson, and Nemaha counties).

#### 14. LAUREL OAK.

*Quercus imbricaria* Michx.—A round topped tree, of moderate size, distinguished from all other Nebraska oaks by the lanceolate-oblong leaves. It is said to occur in the southeastern part of the state (*Sargent*).

#### 15. IRONWOOD.

*Ostrya virginiana* (Mill.) Willd.—A small tree with rough, brownish bark, and close-grained, hard, and tough wood. In the eastern part of the state (Nemaha, Sarpy, and Dixon counties) and in Rock, Brown, Cherry, and Sioux counties on the north.

## 16. BLUE BEECH.

*Carpinus caroliniana* Walter.—A small tree with smooth, grayish bark, and tough, white, close-grained wood. Sarpy county, and doubtfully reported from Brown county (Long Pine). It has probably been confounded with Ironwood.

## 17. HAZEL-NUT.

*Corylus americana* Walt.—A low shrub, well known for its excellent nuts. Eastern part of the state, west to Gage county in the south, and to Cherry county in the north.

## 18. SPECKLED ALDER.

*Alnus incana* Willd.—A small tree, said to be a native of eastern Nebraska (*Sargent*). Its occurrence in the state is very doubtful.

## 19. CANOE BIRCH.

*Betula papyrifera* Marsh.—A large tree, whose bark easily splits into thin papery layers. A few large trees of this species occur in Cherry county, on the north slopes of the high bluffs bordering the Niobrara river, near Fort Niobrara.

## 20. BLACK BIRCH.

*Betula occidentalis* Hook.—A small tree, found in Sioux county only.

## 21. RED BIRCH.

*Betula nigra* L.—A medium sized tree growing along the Missouri river in Cass county (*T. A. Williams*).

**Walnut Family.**

## 22. BUTTERNUT.

*Juglans cinerea* L.—A large tree with a very valuable wood. Found sparingly in the southeastern part of the state (Gage to Johnson, Nemaha, Otoe, and Cass counties).

## 23. BLACK WALNUT.

*Juglans nigra* L.—A tree of large dimensions, with very valuable wood and nuts. Found quite abundantly in the southern, eastern, and northern portions of the state, extending to Franklin, Saline, Burt, Rock and Cherry counties. It is deservedly popular with tree planters, and as a consequence young trees are common in plantations almost throughout the state.

In Cherry, Brown, Rock, and Keya Paha counties the unusual association of Black Walnut and Yellow Pine occurs. I know of no other place on the continent where these two species grow side by side.

#### 24. SHELL-BARK HICKORY.

*Hicoria ovata* (Mill.) Britt.—A large tree of great value, not only for its white, tough wood, but also for its edible nuts. Common in the southeastern counties, from Gage to Cass. (This is *Carya alba* of Gray's Manual.)

#### 25. BIG HICKORY-NUT.

*Hicoria sulcata* (Nutt.) Britt.—A large tree, sparingly found in Richardson county. It is also reported from Sarpy county. Its nuts, which are edible, are much larger and thicker shelled than the preceding. (This is *Carya sulcata* of Gray's Manual.)

#### 26. MOCKER-NUT.

*Hicoria alba* (L.) Britt.—A large tree, with a globular edible nut, said to occur in eastern Nebraska (*Sargent*). (This is *Carya tomentosa* of Gray's Manual.)

#### 27. PIG-NUT.

*Hicoria glabra* (Mill.) Britt.—A large tree, with valuable wood, but inedible nuts. Occurs in Cass and Richardson counties. (This is *Carya porcina* of Gray's Manual.)

#### 28. BITTER HICKORY.

*Hicoria minima* (Marsh.) Britt.—A medium sized tree, with a valuable wood, but inedible nuts. This is the most widely distributed of our hickories, occurring in the southeastern counties to Cass, Lancaster, Johnson, Pawnee, and Nemaha. (This is *Carya amara* of Gray's Manual.)

#### Willow Family.

#### 29. BLACK WILLOW.

*Salix nigra* Marsh.—Our largest willow, growing along the banks of streams, usually bending over the water. Bark rough, light brown. Common from the southeastern to the northwestern portions of the state.

#### 30. ALMOND WILLOW.

*Salix amygdaloides* Anders.—Closely resembling the preceding, but with broader leaves, which are glaucous beneath. Apparently

with the same range as *S. nigra*, with which it is often confounded. The leaves of the Black Willow are much narrower, and are green underneath, while in the Almond Willow they are wider, and "pale or glaucous beneath."

### 31. SHINING WILLOW.

*Salix lucida* Muhl.—A small bushy tree, with smooth shining twigs. Occurs in Cass county.

### 32. SAND-BAR WILLOW.

*Salix longifolia* Muhl.—A small tree, with very narrow leaves. Common in moist situations, on sand-bars, etc., throughout the state. One of the most abundant species on the sand-bars and islands of the Platte river. A variety with shorter leaves and smaller catkins, which grows as a low bush which is often monœcious, is found in Kearney, Gosper, and Scott's Bluff counties (*Rydberg*).

### 33. BEAKED WILLOW.

*Salix rostrata* Rich.—This shrubby species, with lanceolate, dull green, downy leaves, has recently been reported from Dawes and Sioux counties by Mr. H. J. Webber.

### 34. PRAIRIE WILLOW.

*Salix humilis* Marsh.—A low shrub, with soft-hairy, lanceolate leaves. Common on the prairies throughout the state. This might be used as a "cover" in forestry plantings, especially in the sandy regions of the state.

### 35. DWARF WILLOW.

*Salix tristis* Ait.—A low, grayish shrub, with small, narrow, soft-hairy leaves. Reported recently by Mr. H. J. Webber as growing in Custer county; also at Long Pine (*Bates*).

### 36. DIAMOND WILLOW.

*Salix cordata* Muhl., var. *vestita* Anders.—A small tree, or a straggling shrub, with lanceolate leaves; stems bearing diamond-shaped depressions, whence the common name. Heart-wood red and firm, and said to be durable. Common along the Missouri and Niobrara rivers, and also on the Loup and Republican, and in Banner and Scott's Bluff counties.



## 37. QUAKING ASP.

*Populus tremuloides* Michx.—A small tree, with smooth, greenish-white bark; leaves very tremulous on account of the length and thinness of the petioles. Found in the southeastern counties, and also the northwestern; probably throughout the state.

## 38. BALSAM POPLAR.

*Populus balsamifera* L., var. *candicans* Gr.—A tree with heart-shaped leaves which are whitish underneath. Found in Sioux county.

## 39. BLACK COTTONWOOD.

*Populus angustifolia* James.—A fine tree with narrow, willow-like leaves. Found in Sioux and Scott's Bluff counties.

## 40. COTTONWOOD.

*Populus monilifera* Ait.—A large tree, when well grown exceeding every other native tree in the diameter of its stem. Common throughout the state.

## ORDER URTICINÆ.

## Elm Family.

## 41. WHITE ELM.

*Ulmus americana* L.—A large tree, growing along streams throughout the state, often attaining a great size in the eastern counties. A tree in Tecumseh has a spreading dome-shaped top nearly one hundred feet in diameter. Along the margins of Salt creek, above Lincoln, there are many fine specimens of about the same dimensions.

This is the common Elm of the state. It is also known as "Water Elm," and "Swamp Elm." Well grown trees are often called Rock Elm, a name which properly belongs to another species (*U. racemosa*) not found within this state. The White Elm is deservedly popular as a shade tree, especially in towns and cities. It is also extensively grown in young forestry plantations.

Mr. A. J. Brown, a man of much experience in tree planting in Nebraska, in a paper on "Forest Trees for the Plains," published in the last annual report of the Nebraska State Horticultural Society (1891), speaks of this tree as follows:

"White Elm can be grown over nearly the entire state. Like the Ash, it will adapt itself to almost any soil and condition. While it

thrives best on deep, moist soil, it will also live and make a good growth on the poorest clay banks and in the alkali basins, where most other sorts fail. With good cultivation the tree is a rapid grower and is soon able to take care of itself. While the timber is not of the best quality, yet it is valuable for certain mechanical purposes, and the tree should be freely planted.

#### 42. RED ELM.

*Ulmus fulva* Michx.—A medium sized tree, with a mucilaginous bark, from whence one of the popular names—"Slippery Elm"—is derived. Common in the eastern part of the state to Franklin, Adams, Buffalo, and Brown counties. Recently reported from the valley of the Medicine creek in Frontier county by Mr. Rydberg.

#### 43. HACKBERRY.

*Celtis occidentalis* L.—A medium sized, symmetrical tree, with a rough, "hacked" bark. Common throughout the eastern, central, and northern counties to the extreme northwest, and also in Banner and Cheyenne counties.

#### Mulberry Family.

#### 44. RED MULBERRY.

*Morus rubra* L.—A small tree, occurring along the streams of the southeastern portion of the state from Jefferson county to Richardson, Nemaha, Sarpy, and Burt counties.

#### Plane Tree Family.

#### 45. PLANE TREE.

*Platanus occidentalis* L.—A well-known tree with thin white bark. It is commonly but erroneously called "Sycamore," and also bears the name of "Buttonwood." It grows along the Missouri river from Richardson county to Douglas.

### ORDER CENTROSPERMÆ.

#### Goosefoot Family.

#### 46. GREASEWOOD.

*Sarcobatus vermiculatus* Torr.—An erect, spiny, whitish shrub, bearing linear leaves. Sioux and Scott's Bluff counties.

#### 47. ATRIPLEX.

*Atriplex nuttallii* Watson.—A low-branching, scurfy shrub. On the Salt Marshes at Lincoln, in the Bad Lands of the Little

Cottonwood creek in Sioux county, and in Kiowa valley, Scott's Bluff county.

## ORDER POLYCARPICÆ.

### Barberry Family.

#### 48. CREEPING BARBERRY.

*Berberis repens* Lindl.—A low, creeping shrub, with stiff, evergreen, compound leaves. Found in Dawes and Sioux counties.

### Moonseed Family.

#### 49. MOONSEED.

*Menispermum canadense* L.—A woody climber, with green bark and large, angled leaves. Common in woodlands in the eastern counties, from Jefferson to Saline and Cass.

### Custard-Apple Family.

#### 50. PAPAWE.

*Asimina triloba* (L.) Dunal.—A shrub, or small tree, bearing fleshy, edible fruits. Found in Pawnee, Richardson, Nemaha, Otoe, and Saunders counties.

## ORDER COLUMNIFERÆ.

### Linden Family.

#### 51. BASSWOOD.

*Tilia americana* L.—A medium or large sized tree, with gray bark and white, soft wood. Flowers producing much honey. Native of the eastern and northern counties from Jefferson to Gage, Richardson, Cass, Douglas, Rock, and Brown.

## ORDER TEREBINTHINÆ.

### Rue Family.

#### 52. PRICKLY ASH.

*Xanthoxylum americanum* Mill.—A prickly shrub with aromatic bark and foliage. Common on moist, rich land in the southeastern counties from Gage to Richardson, Nemaha, and Cass, and also in Rock and Brown counties.

### Cashew Family.

#### 53. SMOOTH SUMACH.

*Rhus glabra* L.—A low shrub, common on the prairies, and along streams throughout the state, from the southeastern counties to Sioux county in the northwest.

## 54. DWARF SUMACH.

*Rhus copallina* L.—Smaller than the preceding, from which it may be distinguished by the wing-margined petioles. Confined to the extreme southeastern part of the state (Richardson county).

## 55. POISON IVY.

*Rhus toxicodendron* L.—A trailing or climbing vine, with large tri-foliolate compound leaves. A noxious plant on account of its poisonous foliage. Common throughout the state.

## 56. LOW SUMACH.

*Rhus canadensis* Marsh., var. *trilobata* (Nutt.) Gr.—A low, spreading shrub, with small, tri-foliolate compound leaves. Common on hillsides north and west from Franklin county to Rock, Sioux, and Banner.

## ORDER ÆSCULINÆ.

## Soapberry Family.

## 57. OHIO BUCKEYE.

*Æsculus glabra* Willd.—A small tree, with prickly fruit, containing one or two large brown seeds. Grows naturally in Pawnee, Richardson, and Nemaha counties.

## Maple Family.

## 58. MOUNTAIN MAPLE.

*Acer glabrum* Torr.—A small tree, confined to the headwaters of Hat creek in Sioux county.

## 59. SILVER MAPLE.

*Acer saccharinum* L.—This is the common "Soft Maple" of the eastern part of the state. Leaves silvery-white and smooth on the under side. Found in the counties east of the 98th meridian. This species is commonly described under the name of *Acer dasycarpum* of Ehrhart, but the earlier name given by Linnæus should have preference. Many people in the eastern part of the state suppose our tree to be the Red Maple (*A. rubrum*), but that very distinct species does not grow naturally within our borders.

## 60. SUGAR MAPLE.

*Acer barbatum* Michx.—This well known tree, which commonly bears a second name of Hard Maple, is said to occur in the eastern

part of the state (*Sargent*). This is probably an error. In the books this species has usually hitherto borne the name of *Acer saccharinum* of Wangenheim.

#### 61. BOX ELDER, OR ASH-LEAVED MAPLE.

*Acer negundo* L.—A medium sized tree, of rapid growth, producing a good wood for fuel, having one-half the heating value of Shell-bark Hickory. Grows wild throughout the state.

This hardy tree is one of the best for planting upon the plains. It is easily propagated, and grows rapidly. It has been extensively planted upon "tree claims" throughout the western counties.

In most recent books this tree bears the name *Negundo aceroides*, but the latest authorities now decide that the name given by Linnæus, *Acer negundo*, is preferable. This allows us to properly use the English name, "Ash-leaved Maple," which has always been a favorite with many horticulturists and landscape gardeners.

### ORDER FRANGULINÆ.

#### Staff-Tree Family.

#### 62. BITTERSWEET.

*Celastrus scandens* L.—A twining climber, often strangling the supporting tree by its tight coils. The pods burst in the fall and expose the red seeds. Common along the streams throughout the state.

#### 63. WAAHOO.

*Euonymus atropurpureus* Jacq.—A pretty shrub, with dark-purple 4-merous flowers, and the twigs marked with four longitudinal white lines. Occurs in the southeastern counties from Jefferson to Saline, Butler, Sarpy, Cass, Nemaha, and Pawnee.

#### 64. STRAWBERRY BUSH.

*Euonymus americanus* L.—A low shrub, somewhat like the last, but with greenish-purple 5-merous flowers. Cass county.

#### 65. TRAILING STRAWBERRY BUSH.

*Euonymus americanus* L., var. *obovatus* T. & G.—Trailing on the ground, and rooting; otherwise much like the last. Cass county.

**Bladder-Nut Family.**

## 66. BLADDER-NUT.

*Staphylea trifolia* L.—A shrub bearing large bladder-like fruits, containing a few seeds. Confined to the southeastern counties, from Richardson to Cass and Sarpy.

**Buckthorn Family.**

## 67. LOW BUCKTHORN.

*Rhamnus alnifolia* L'Her.—A low shrub, with three-seeded berry-like fruits; said to occur in Nebraska (*Gray's Manual*).

## 68. BUCKTHORN.

*Rhamnus lanceolatus* Pursh.—A tall shrub, or small tree, not thorny, with two-seeded berry-like fruits. In some localities called "Stinkberry." In southeastern Nebraska, from Gage county to Cass, Saunders, and Sarpy, and also reported (*J. M. Bates*) from the northern part of the state in Cherry county. Probably in the northeastern counties.

## 69. INDIAN CHERRY.

*Rhamnus caroliniana* Walt.—A small thornless tree, with three-seeded berry-like fruits. Saunders and Cass counties.

## 70. NEW JERSEY TEA.

*Ceanothus americanus* L.—A small shrub with stiff upright twigs, large downy leaves, numerous small white flowers, and a large red root. Eastern and northern Nebraska, from Jefferson to Nemaha, Lancaster, Cass, and Brown counties.

## 71. RED ROOT.

*Ceanothus ovatus* Desf.—Resembling the preceding, but with smaller leaves. Apparently more widely distributed, from Nemaha and Cass counties to Lancaster, Saline, Custer, Thomas, and Cherry.

**Vine Family.**

## 72. SUMMER GRAPE.

*Vitis æstivalis* Michx.—With the leaves woolly or hairy underneath, and the berries ripening in September. Said to occur in Cass county, but probably an error.

## 73. FROST GRAPE.

*Vitis cordifolia* Michx.—With the leaves smooth on both sides, stipules small, and very sour black berries, which ripen after frosts. Said to occur in Nebraska (*Gray's Manual*), but probably an error.

## 74. EARLY WILD GRAPE.

*Vitis riparia* Michx.—With smooth leaves, large stipules, and sweet, juicy berries, which are covered with a whitish, powdery coat ("bloom"); ripening before frosts. Grows throughout the state, even to the extreme northwestern part.

## 75. VIRGINIA CREEPER.

*Parthenocissus quinquefolia* (L.) Planch.—A well known ornamental climber, with five-foliate compound leaves. It is usually called by the name of *Ampelopsis quinquefolia*, but Planchon, who has carefully studied the vines, concludes that it must be placed in a new genus as above. It grows commonly throughout the state, even to the extreme northwest (Sioux county).

## ORDER UMBELLIFLORÆ.

## Dogwood Family.

## 76. KINNIKINNIK.

*Cornus sericea* L.—A shrub with purple stems; the smaller twigs and the leaves, underneath, are silky; the fruits are pale blue. Southeastern counties (Nemaha and Cass). Professor Swezey reports it from Dawes county.

## 77. ROUGH-LEAVED DOGWOOD.

*Cornus asperifolia* Michx.—A shrub with branchlets brownish, the pubescent leaves harsh above, and fruits white. Buffalo, Saline, Lancaster, and Cass counties.

## 78. RED-OSIER DOGWOOD.

*Cornus stolonifera* Michx.—A shrub with smooth, straight, red-purple branchlets; leaves whitish beneath, and fruits lead-colored or white. Apparently common in the eastern and northern portions of the state from Kearney and Franklin to Cass, Antelope, Rock, Brown, Cherry, Sheridan, and Sioux counties, and also in Scott's Bluff county.

## 79. DOGWOOD.

*Cornus candidissima* Marsh.—A shrub with smooth, gray branchlets; leaves whitish beneath, and fruits white. Franklin, Jefferson, Butler, Cass, Johnson, and Nemaha counties.

There is little doubt that the species of *Cornus* in the state have been badly confounded by observers. There is much need of further study.

## ORDER SAXIFRAGINÆ.

## Saxifrage Family.

## 80. PRICKLY GOOSEBERRY.

*Ribes cynosbati* L.—Shrub prickly, with prickly berries. Antelope county.

## 81. SMOOTH GOOSEBERRY.

*Ribes gracile* Michx.—Shrub prickly, with smooth berries. Throughout the state, even to the extreme northwest (Sioux county).

## 82. WILD RED CURRANT.

*Ribes cereum* Dougl.—Shrub not prickly, leaves resinous, calyx tubular, pinkish; berries red, glandular-hairy. Dawes, Sioux and Banner counties.

## 83. WILD BLACK CURRANT.

*Ribes floridum* L'Her.—Shrub not prickly, leaves resinous, calyx whitish or greenish; berries black, smooth. Widely distributed throughout the greater part of the state, from Franklin county to Custer, Thomas, Cherry, Dawes, Scott's Bluff, Brown, Rock, Antelope, Sarpy, and Nemaha.

## 84. GOLDEN CURRANT.

*Ribes aureum* Pursh.—Shrub not prickly, leaves not resinous, flowers yellow, sweet scented, berries yellowish, or black. Apparently a native of the western half of the state, from Franklin, Custer, and Rock counties westward.

This species is very variable in habit of the plant, leaves, and fruits, as has been noticed by several observers. Mr. Rydberg, who has made a careful study of these forms in the North Platte river region, describes them as follows:

(a.) Fruit black and spherical. This is the most common form.



- (b.) Fruit yellow and spherical. Found in canyons in Scott's Bluff county.
- (c.) Fruit black, ellipsoid, and large. Found on the Platte bottoms in Scott's Bluff county.

**Witch Hazel Family.**

**85. WITCH HAZEL.**

*Hamamelis virginiana* L.—A curious shrub, with yellow-petaled flowers which appear late in the fall, the seeds ripening the next season. Cass county.

**ORDER THYMELÆINÆ.**

**Oleaster Family.**

**86. BUFFALO BERRY.**

*Shepherdia argentea* Nutt.—A shrub or small tree with a whitish foliage and sour, red berries. From Saunders and Franklin counties west and north to Cheyenne, Scott's Bluff, Dawes, and Sioux. In Sheridan and Rock counties there is a variety with bright amber-yellow berries.

There appears to be no difference in the trees of these two varieties, either as to form and size of the trees themselves, or of their leaves. The amber berries are of a milder taste, and appear to me to be more promising for cultivation than the red ones. Professor Williams, of Brookings, S. D., reports the occurrence of the amber variety in abundance in South Dakota between the Missouri river and the Black Hills.

**ORDER ROSIFLORÆ.**

**Rose Family.**

**87. WILD PLUM.**

*Prunus americana* Marsh.—A small, thorny tree, producing yellow or red fruits from three-fourths to one inch in diameter. Common throughout the state, even to the extreme western portion (Sioux county).

This is the only plum certainly known to grow wild in the state. It may be that we have confused two or more species in what we now regard as a very variable single species. In the opinion of some of our horticulturists there are several distinguishable species, while others are equally positive that all the varieties grade into one another so fully as to render their separation impossible. There is

much variability in the fruits and pits, the former differing not only in color, but also in size and taste, while the pits vary much in size, shape, and structure. The leaves appear to be pretty uniform in size, shape, and structure, the margins always being sharply and rather coarsely serrate.

Occasionally I hear of a "Sand Plum," said to grow in the southwestern and western parts of the state. No authentic specimens have been seen, although I have in my collection some twigs and leaves from plants cultivated under this name, and thought, by the growers, to have been taken up from wild patches in the state. Although lacking in flowers or fruits, these cultivated Sand Plums appear to be *Prunus chicasa*, the Chickasaw Plum. The leaves of these specimens are much smaller than those of the ordinary wild plums; they are also smoother and firmer, and the margins have smaller serrations. Specimens of these, wherever known to occur, are greatly desired.

#### 88. SAND CHERRY.

*Prunus pumila* L.—A low, smooth shrub, with narrow, thickish leaves which are pale beneath. The edible and somewhat astringent fruits are about one-half inch in diameter, and when fully ripe are black-purple. On sandy lands from Pierce, Merrick, and Webster counties, westward to Colorado and Wyoming.

No native fruit appears more promising this. Even in a wild state it is very prolific, and when fully ripe it is edible in the uncooked state. The astringency which is present in the unripe fruits, almost or entirely disappears at maturity. Plants appear to differ a good deal in the amount of astringency, as well as in the size and shape of the cherries which they bear.

In many parts of the state the Sand Cherry has been transplanted to the garden or orchard. Wherever this has been done the results have been encouraging. The plants become larger and the cherries are larger and more abundant. They root freely from layers, and hence are propagated with the greatest ease.

My studies of this interesting native cherry, supplemented by the testimony of numerous observers in all parts of the state where it grows, lead me to the conclusion that we have here a fruit which needs only a few years of cultivation and selection, to yield us a most valuable addition to our small fruit gardens. It has recently at-

tracted the attention of cultivators in the states eastward, as a promising stock upon which to graft or bud some of the more tender varieties of the cultivated cherries of the Old World.

Mr. W. Miller, of Dundy county, in a recent letter says: "I think the Sand Cherry is destined to become a very good and useful garden cherry. In their wild state they are little inferior to some of the cultivated ones. The people about here, when the cherry season comes, go with their wagons and gather them wholesale. I hear of quite a number who have transplanted them to their gardens."

#### 89. CHOKe CHERRY.

*Prunus virginiana* L.—A shrub, or small tree, with thin, sharply serrate leaves, and small, very astringent, inedible, dark-crimson fruits. In the southeastern counties, Richardson, Nemaha, Pawnee, Johnson, Cass, Saline, and Franklin. What appears to be this species, or possibly a variety of the next, is found in Brown and Rock counties in Long Pine canyon.

#### 90. DWARF WILD CHERRY.

*Prunus demissa* Walp.—An upright shrub of stout habit, with thickish blunt serrate leaves, and large (one-third to one-half inch) black-purple, edible fruits. Common from Brown, Custer, and Frontier counties westward to Sioux, Banner, and Dundy. Usually called "Choke Cherry" by the settlers, who freely use the cherries for pastry, jellies, etc.

This shrubby plant promises to become important for its excellent cherries. They are often as large as the smallest of our cultivated cherries, and have an agreeable taste closely resembling that of the Wild Black Cherry (*Prunus serotina*). I have often eaten them freely from the bushes (which are rarely more than five to eight feet high), and can testify to their freedom from the astringency of the genuine Choke Cherry (*P. virginiana*). I have also eaten them cooked, and can certify to their excellence in this state. "Choke Cherry" pies are excellent eating, in spite of their forbidding name.

#### 91. WILD BLACK CHERRY.

*Prunus serotina* Ehrh.—A large tree, with thickish blunt-serrate leaves, and small black-purple edible fruits. Franklin, Pawnee, Richardson, Nemaha, and Cass counties.

## 92. NINE-BARK.

*Niellia opulifolia* (L.) Benth. & Hook.—A spreading shrub, with the bark on the old stems loose and shreddy. Rock and Brown counties.

## 93. RED RASPBERRY.

*Rubus strigosus* Michx.—Stems with few prickles, little if at all glaucous, fruit light red. Throughout the eastern half of the state from Nemaha, Lancaster, and Cass counties to Custer, Thomas, Rock, and Brown. As it occurs abundantly in the Black Hills of South Dakota (where it becomes dwarfed to a low bush only a few inches in height) it is probable that it will be found throughout the whole of Nebraska.

## 94. BLACK RASPBERRY.

*Rubus occidentalis* L.—Stems glaucous all over, armed with stout prickles, fruit black. Nemaha, Sarpy, Saline, Pawnee, and Franklin counties in the southeast, and Brown, Cherry, Sheridan, and Sioux in the northwest. Probably throughout the state.

## 95. BLACKBERRY.

*Rubus villosus* Ait.—Stem not glaucous, armed with stout prickles, fruit black. Said to occur in the eastern counties, but probably escaped from cultivation.

## 96. MOUNTAIN MAHOGANY.

*Cercocarpus parvifolius* Nutt.—A shrub with small wedge-shaped, silky-hairy leaves. On the sides of bluffs, Banner and Scott's Bluff counties.

## 97. CLIMBING PRAIRIE ROSE.

*Rosa setigera* Michx.—Stems long, climbing, armed with stout prickles. Richardson county.

## 98. SMOOTH ROSE.

*Rosa blanda* Ait.—Stems low, with few prickles or none. In the extreme western portion only, in canyons.

## 99. PRAIRIE ROSE.

*Rosa arkansana* Porter.—Stems low, very prickly. Common on the prairies throughout the state.

## 100. PRICKLY ROSE.

*Rosa nutkana* Presl.—Stems stout, with stout spines. Frontier and Deuel counties.

## 101. TAIL ROSE.

*Rosa fendleri* Crepin.—Stems often tall, with weaker prickles than the preceding. Dawes county, to Cheyenne and Frontier.

## 102. LOW ROSE.

*Rosa woodsii* Lindl.—Stems low, but little prickly. Dawes and Sioux counties, to Banner and Scott's Bluff. "Apparently the most common rose in northwest Nebraska, and on the outskirts of the Bad Lands." (*Webber*).

## 103. WILD CRAB-APPLE.

*Pirus coronaria* L.—A small tree, with rose-colored flowers, and small greenish apples. Has been reported from Gage, Johnson, Nemaha, and Butler counties.

## 104. HAWTHORN.

*Crataegus tomentosa* L.—A small, thorny tree, with ovate, sharply serrate leaves, and small red fruits. Richardson, Nemaha, Sarpy, Douglas, and Lancaster counties.

## 105. HAWTHORN.

*Crataegus coccinea* L.—Much like the preceding, but the leaves smaller, less toothed, and wedge-shaped at the base. Brown and Cherry counties.

## 106. SERVICE-BERRY.

*Amelanchier canadensis* (L.) Medik.—A small tree with ovate leaves. Richardson and Nemaha counties.

## 107. SMALL SERVICE-BERRY.

*Amelanchier alnifolia* Nutt.—A shrub with broadly elliptical, glaucous leaves. Rock county westward to Sioux and Banner.

**ORDER BICORNES.****Heath Family.**

## 108. BEAR-BERRY.

*Arctostaphylos uva-ursi* Spreng.—A trailing shrub, with oblong-spatulate evergreen leaves; berry one-third inch in diameter, bright red. In a canyon near Anselmo, in Custer county.

**ORDER LEGUMINOSÆ.****Bean Family.****109. SHOE STRING.**

*Amorpha canescens* Nutt.—A low, whitish shrub, with purple flowers, and long tough roots, whence the common name. Widely distributed on the upper lands from Nemaha and Cass counties in the east to Sioux, Deuel, and Dundy in the west, and probably throughout the state.

**110. FALSE INDIGO.**

*Amorpha fruticosa* L.—A smooth shrub, with purple spikes of small flowers. On moist lands, from the eastern counties to Franklin, Cherry, Dawes, Sioux, Deuel, and Dundy counties. Probably throughout the state.

**111. RED BUD.**

*Cercis canadensis* L.—A small tree, peculiar in the red-purple clusters of flowers which precede the leaves. From Richardson to Cass, Lancaster, Saline, and Johnson counties.

**112. KENTUCKY COFFEE TREE.**

*Gymnocladus dioica* (L.) Koch.—A tall tree (or in Nebraska usually small) with rough, scaly bark, and large thick pods (six to eight inches long) containing a few very hard seeds one-half inch in diameter. From Richardson county to Pawnee, Lancaster, Sarpy, Cuming, Dixon, and Rock.

**113. HONEY LOCUST.**

*Gleditsia triacanthos* L.—A large, thorny tree, bearing long, thin, twisted pods. In the southeastern counties, from Franklin county to Pawnee, Johnson, Nemaha, Saline, Lancaster, Cass, and Douglas. I have adopted Professor Sargent's spelling of the generic name, *Gleditsia*, instead of *Gleditschia*.

**ORDER CONTORTÆ.****Olive Family.****114. WHITE ASH.**

*Fraxinus americana* L.—A large tree, with smooth leaves and twigs, and with the oar-shaped fruit ("seed") bearing a thickened, oblong, blunt, grain-like seed-pod. Occurs in eastern Nebraska, from Sarpy county southward.

## 115. GREEN ASH.

*Fraxinus viridis* Michx.—A small-sized tree with smooth leaves and twigs, and with the oar-shaped fruit ("seed") bearing a narrow, slender, and pointed seed-pod. Common along streams throughout the state.

## 116. RED ASH.

*Fraxinus pubescens* Lam.—Closely resembling the preceeding, but with velvety-downy leaves and twigs, and more nearly entire leaflets. The fruits ("seeds") are like those of Green Ash. Apparently with the preceding species throughout the state; doubtless the two species are often confounded.

## ORDER RUBIINÆ.

## Madder Family.

## 117. BUTTON BUSH.

*Cephalanthus occidentalis* L.—A shrub bearing glossy leaves, and round balls of small white flowers. Along streams in Cuming county, and also in Nemaha county.

## Honeysuckle Family.

## 118. ELDER.

*Sambucus canadensis* L.—A shrub with a large pith, white, fragrant flowers, and small, black-purple edible berries. Jefferson county to Richardson, Saline, Lancaster, Sarpy, Dakota, Dixon and Brown.

## 119. SHEEP-BERRY.

*Viburnum lentago* L.—A shrub bearing simple leaves, white flowers and black, rather large (one-half inch long) edible berries. Cass county.

## 120. INDIAN CURRANT.

*Symphoricarpos vulgaris* Michx.—A low shrub growing on low lands, bearing clusters of small red berries in the axils of the upper leaves. Franklin county to Pawnee, Nemaha, Lancaster, Cass, and Brown.

## 121. WOLF BERRY, OR "BUCK BRUSH."

*Symphoricarpos accidentalis* Hook.—A low shrub, growing on low lands, bearing clusters of small white berries in the axils of the upper leaves. Throughout the state.

## 122. SNOWBERRY.

*Symphoricarpos racemosus* Michx., var. *pauciflorus* Robbins.—A very small shrub with a few white berries in the axils of the upper leaves. Cherry and Sioux counties.

## 123. TRUMPET HONEYSUCKLE.

*Lonicera sempervirens* Ait.—A twining shrub bearing long tubular red flowers. Said to grow wild in Cass county, but probably an error.

## 124. YELLOW HONEYSUCKLE.

*Lonicera flava* Sims.—A twining shrub bearing pale-yellow flowers. Nemaha county.

## 125. SMALL HONEYSUCKLE.

*Lonicera glauca* Hill.—A small twining shrub bearing small greenish-yellow or purplish flowers. Nemaha and Cherry counties.

## ORDER AGGREGATÆ.

## Sunflower Family.

## 126. SAGE BRUSH.

*Artemisia tridentata* Nutt.—A much branched, scraggy shrub, with wedge-shaped, three-toothed leaves. Dawes and Sioux counties.

## 127. LITTLE SAGE BRUSH.

*Artemisia cana* Pursh.—Much like the preceding, but the leaves lance-linear. Dawes and Sioux counties.

## 128. WORMWOOD.

*Artemisia filifolia* Torr.—A low, whitish plant, woody below, with three-parted filiform leaves. Box Butte and Dawes counties.

## 129. TALL BIGELOVIA.

*Bigelovia graveolens* Gray, var. *glabrata* Gray. A bright-green shrub from four to seven feet high. In canyons of Scott's Bluff county.

## 130. LOW BIGELOVIA.

*Bigelovia howardi* Gray.—A much branched, low shrub, of a whitish color, growing on the rocky hills of Scott's Bluff and Banner counties.

## 131. GREEN GREASEWOOD.

*Gutierrezia euthamiae* T. & Gr.—A small, erect, green plant, woody at base, with narrowly linear leaves. Dawes and Sioux counties.



## NUMBER OF TREES AND SHRUBS.

The foregoing list contains:

Trees .....	62
Shrubs .....	69

## DISTRIBUTION, WITH REFERENCE TO ELEVATION.

If we inquire as to the distribution of these species, with reference to the altitude of the country above sea-level, we find some interesting and instructive facts. In the southeast corner of the state (in Richardson county) the surface of the land is a little less than nine hundred feet above the sea. There is a narrow strip, varying from a few miles in width to perhaps fifteen or twenty miles, and running northward along the Missouri river nearly to Dakota county, in which the surface is not more than one thousand feet above the sea. The line of two thousand feet altitude enters the state in Keya Paha county, and soon curves westward nearly to the Cherry county line on the Niobrara river; south of this river it curves eastward to Knox and even Cedar counties, soon returning through Antelope to the southeast part of Holt; from this point it zigzags southward through Wheeler, Greeley, Howard, Hall, Adams to Webster, where it bears westward through Franklin to Harlan, crossing the Republican river near Oxford, returning eastward and passing into Kansas from Webster county. West of this line the country rises rapidly to the three thousand foot line which zigzags across the state not far from the 101st meridian. The four thousand foot line lies mainly between the 102d and 103d meridian. Elevations of five thousand feet are common in Sioux, Scott's Bluff, and Banner counties.

After a prolonged study of the distribution of our woody plants I have taken the two thousand foot line as a dividing line between the lower and higher regions. Upon this basis I have made the following lists, which include (in No. 1) those which are confined to the higher region above 2,000 feet, (in No. 2) those which grow naturally both above and below 2,000 feet, and (in No. 3) those which are naturally found only below the line of 2,000 feet above sea level.

## No. 1.—ABOVE 2,000 FEET.

- |                        |                           |
|------------------------|---------------------------|
| 1. Yellow Pine.        | 96. Mountain Mahogany.    |
| 2. Juniper.            | 98. Smooth Rose.          |
| 19. Canoe Birch.       | 100. Prickly Rose.        |
| 20. Black Birch.       | 101. Tall Rose.           |
| 33. Beaked Willow.     | 102. Low Rose.            |
| 35. Dwarf Willow.      | 104. Hawthorn.            |
| 38. Balsam Poplar.     | 107. Small Service-berry. |
| 39. Black Cottonwood.  | 108. Bear-berry.          |
| 46. Greasewood.        | 122. Snowberry.           |
| 48. Creeping Barberry. | 126. Sage Brush.          |
| 58. Mountain Maple.    | 127. Little Sage Brush.   |
| 82. Wild Red Currant.  | 128. Wormwood.            |
| 84. Golden Currant.    | 129. Tall Bigelovia.      |
| 90. Dwarf Wild Cherry. | 130. Low Bigelovia.       |
| 92. Nine-bark.         | 131. Green Greasewood.    |

## No. 2.—BOTH ABOVE AND BELOW 2,000 FEET.

- |                      |                         |
|----------------------|-------------------------|
| 3. Red Cedar.        | 61. Box Elder.          |
| 4. Greenbrier.       | 62. Bittersweet         |
| 7. Bur Oak.          | 74. Early Wild Grape.   |
| 15. Ironwood.        | 75. Virginia Creeper.   |
| 29. Black Willow.    | 78. Red-osier Dogwood.  |
| 30. Almond Willow.   | 81. Smooth Gooseberry.  |
| 32. Sand-bar Willow. | 83. Wild Black Currant. |
| 34. Prairie Willow.  | 86. Buffalo Berry.      |
| 36. Diamond Willow.  | 87. Wild Plum.          |
| 37. Quaking Asp.     | 88. Sand Berry.         |
| 40. Cottonwood.      | 94. Black Raspberry.    |
| 41. White Elm.       | 99. Prairie Rose.       |
| 42. Red Elm.         | 109. Shoe String.       |
| 43. Hackberry.       | 110. False Indigo.      |
| 47. Atriplex.        | 114. Green Ash.         |
| 53. Smooth Sumach.   | 115. Red Ash.           |
| 55. Poison Ivy.      | 121. Wolf-berry.        |
| 56. Low Sumach.      |                         |

## No. 3.—BELOW 2,000 FEET.

- |                    |                     |
|--------------------|---------------------|
| 5. White Oak.      | 12. Scrub Oak.      |
| 6. Post Oak.       | 13. Black Oak.      |
| 8. Yellow Oak.     | 14. Laurel Oak.     |
| 9. Low Yellow Oak. | 15. Hazel-Nut.      |
| 10. Red Oak.       | 16. Blue Beech.     |
| 11. Scarlet Oak.   | 17. Speckled Alder. |

- |                               |                            |
|-------------------------------|----------------------------|
| 21. Red Birch                 | 71. Red Root.              |
| 22. Butternut.                | 72. Summer Grape.          |
| 23. Black Walnut.             | 73. Frost Grape.           |
| 24. Shell-bark Hickory.       | 76. Kinnikinnik.           |
| 25. Big Hickory-Nut.          | 77. Rough-leaved Dogwood.  |
| 26. Mocker-Nut.               | 79. Dogwood.               |
| 27. Pig-Nut.                  | 80. Prickly Gooseberry.    |
| 28. Bitter Hickory.           | 85. Witch Hazel.           |
| 31. Shining Willow.           | 89. Choke Cherry.          |
| 44. Mulberry.                 | 91. Wild Black Cherry.     |
| 45. Plane Tree.               | 93. Red Raspberry.         |
| 49. Moonseed.                 | 95. Blackberry.            |
| 50. Papaw.                    | 97. Climbing Rose.         |
| 51. Basswood.                 | 103. Wild Crab-Apple.      |
| 52. Prickly Ash.              | 104. Hawthorn.             |
| 54. Dwarf Sumach.             | 106. Service-berry.        |
| 57. Ohio Buckeye.             | 111. Red Bud.              |
| 59. Silver Maple.             | 112. Kentucky Coffee Tree. |
| 60. Sugar Maple.              | 113. Honey Locust.         |
| 63. Waahoo.                   | 114. White Ash.            |
| 64. Strawberry Bush.          | 117. Button Bush.          |
| 65. Trailing Strawberry Bush. | 118. Elder.                |
| 66. Bladder-Nut.              | 119. Sheep-berry.          |
| 67. Low Buckthorn.            | 120. Indian Currant.       |
| 68. Buckthorn.                | 123. Trumpet Honeysuckle.  |
| 69. Indian Cherry.            | 124. Yellow Honeysuckle.   |
| 70. New Jersey Tea.           | 125. Small Honeysuckle.    |

## DISTRIBUTION IN DIFFERENT PARTS OF THE STATE.

If we roughly divide the state into four sections, viz., Northwest, Northeast, Southwest, Southeast, using the 100th meridian for the line of separation between the east and the west, we may more readily locate the species recorded in this report. This is done in the following lists. From these it will be seen that there are

In the Northwest.....	67	woody plants.
In the Northeast.....	54	“ “
In the Southwest.....	33	“ “
In the Southeast.....	100	“ “

## IN THE NORTHWEST.

- |                        |                            |
|------------------------|----------------------------|
| 1. Yellow Pine.        | 74. Early Wild Grape.      |
| 2. Juniper.            | 75. Virginia Creeper.      |
| 3. Red Cedar.          | 78. Red-osier Dogwood.     |
| 4. Greenbrier.         | 81. Smooth Gooseberry.     |
| 7. Bur Oak.            | 82. Wild Red Currant.      |
| 15. Ironwood.          | 83. Wild Black Currant.    |
| 17. Hazel-Nut.         | 84. Golden Currant.        |
| 19. Canoe Birch.       | 86. Buffalo Berry.         |
| 20. Black Birch.       | 87. Wild Plum.             |
| 23. Black Walnut.      | 88. Sand Cherry.           |
| 29. Black Willow.      | 90. Dwarf Wild Cherry.     |
| 30. Almond Willow.     | 92. Nine-bark.             |
| 32. Sand-bar Willow.   | 94. Black Raspberry.       |
| 33. Beaked Willow.     | 96. Mountain Mahogany.     |
| 34. Prairie Willow.    | 98. Smooth Rose.           |
| 35. Dwarf Willow.      | 99. Prairie Rose.          |
| 36. Diamond Willow.    | 101. Tall Rose.            |
| 37. Quaking Asp.       | 102. Low Rose.             |
| 38. Balsam Poplar.     | 105. Hawthorn.             |
| 39. Black Cottonwood.  | 107. Little Service-berry. |
| 40. Cottonwood.        | 108. Bear-berry.           |
| 41. White Elm.         | 109. Shoe String.          |
| 43. Hackberry.         | 110. False Indigo.         |
| 46. Greasewood.        | 115. Green Ash.            |
| 47. Atriplex.          | 116. Red Ash.              |
| 48. Creeping Barberry. | 121. Wolf-berry.           |
| 53. Smooth Sumach.     | 122. Snowberry.            |
| 55. Poison Ivy.        | 126. Sage Brush.           |
| 56. Low Sumach.        | 127. Little Sage Brush.    |
| 58. Mountain Maple.    | 128. Wormwood.             |
| 61. Box Elder.         | 129. Tall Bigelovia.       |
| 62. Bittersweet.       | 130. Low Bigelovia.        |
| 68. Buckthorn.         | 131. Green Greasewood.     |
| 71. Red Root.          |                            |

## IN THE NORTHEAST.

- |                 |                      |
|-----------------|----------------------|
| 3. Red Cedar.   | 23. Black Walnut.    |
| 4. Greenbrier.  | 29. Black Willow.    |
| 7. Bur Oak.     | 30. Almond Willow.   |
| 10. Red Oak.    | 32. Sand-bar Willow. |
| 15. Ironwood.   | 34. Prairie Willow.  |
| 16. Blue Beech. | 36. Diamond Willow.  |
| 17. Hazel-Nut.  | 37. Quaking Asp.     |

40. Cottonwood.
41. White Elm.
42. Red Alm.
43. Hackberry.
44. Red Mulberry.
51. Basswood.
52. Prickly Ash.
53. Smooth Sumach.
58. Poison Ivy.
59. Silver Maple.
61. Box Elder.
62. Bittersweet.
68. Buckthorn.
70. New Jersey Tea
71. Red Root.
74. Early Wild Grape.
75. Virginia Creeper.
76. Red-osier Dogwood.
80. Prickly Gooseberry.
81. Smooth Gooseberry.

83. Wild Black Currant.
84. Golden Currant.
86. Buffalo Berry.
87. Wild Plum.
88. Sand Cherry.
90. Dwarf Wild Cherry.
93. Red Raspberry.
94. Black Raspberry.
99. Prairie Rose.
105. Hawthorn.
106. Little Service-berry.
107. Shoe String.
110. False Indigo.
112. Kentucky Coffee Tree.
115. Green Ash.
116. Red Ash.
117. Button Bush.
118. Elder.
120. Indian Currant.
121. Wolf-berry.

## IN THE SOUTHWEST.

3. Red Cedar.
4. Greenbrier.
29. Black Willow.
30. Almond Willow.
32. Sand-bar Willow.
34. Prairie Willow.
36. Diamond Willow.
37. Quaking Asp.
40. Cottonwood.
41. White Elm.
42. Red Elm.
43. Hackberry.
53. Smooth Sumach.
55. Poison Ivy.
56. Low Sumach.
61. Box Elder.
62. Bittersweet.

74. Early Wild Grape.
75. Virginia Creeper.
81. Smooth Gooseberry.
83. Wild Black Currant.
84. Golden Currant.
86. Buffalo Berry.
87. Wild Plum.
88. Sand Cherry.
94. Black Raspberry.
99. Prairie Rose.
100. Prickly Rose.
109. Shoe String.
110. False Indigo.
115. Green Ash.
116. Red Ash.
121. Wolf-berry.

## IN THE SOUTHEAST.

4. Greenbrier.
5. White Oak.
6. Post Oak.
7. Bur Oak.

8. Yellow Oak.
9. Low Yellow Oak.
10. Red Oak.
11. Scarlet Oak.

12. Scrub Oak.
13. Black Oak.
14. Laurel Oak.
15. Ironwood.
17. Hazel-Nut.
18. Speckled Alder.
21. Red Birch.
22. Butternut.
23. Black Walnut.
24. Shell-bark Hickory.
25. Big Hickory-Nut.
26. Mocker-Nut.
27. Pig-Nut.
28. Bitter Hickory.
29. Black Willow.
30. Almond Willow.
31. Shining Willow.
32. Sand-bar Willow.
34. Prairie Willow.
36. Diamond Willow.
37. Quaking Asp.
40. Cottonwood.
41. White Elm.
42. Red Elm.
43. Hackberry.
44. Red Mulberry.
45. Plane Tree.
47. Atriplex.
94. Moonseed.
50. Papaw.
51. Basswood.
52. Prickly Ash.
53. Smooth Sumach.
54. Dwarf Sumach.
55. Poison Ivy.
56. Low Sumach.
57. Ohio Buckeye.
59. Silver Maple.
60. Sugar Maple.
61. Box Elder.
62. Bittersweet.
63. Waahoo.
64. Strawberry Bush.
65. Trailing Strawberry Bush.
66. Bladder-Nut.
67. Low Buckthorn.
68. Buckthorn.
69. Indian Cherry.
70. New Jersey Tea.
71. Red Root.
72. Summer Grape.
73. Frost Grape.
74. Early Wild Grape.
75. Virginia Creeper.
76. Kiunnikinnik.
77. Rough-leaved Dogwood.
78. Red-osier Dogwood.
79. Dogwood.
81. Smooth Gooseberry.
83. Wild Black Currant.
84. Golden Currant.
85. Witch Hazel.
86. Buffalo Berry.
87. Wild Plum.
88. Sand Cherry.
89. Choke Cherry.
91. Wild Black Cherry.
93. Red Raspberry.
94. Black Raspberry.
95. Blackberry.
97. Climbing Rose.
99. Prairie Rose.
103. Wild Crab-Apple.
104. Hawthorn.
106. Service-berry.
109. Shoe String.
110. False Indigo.
111. Red Bud.
112. Kentucky Coffee Tree.
113. Honey Locust.
114. White Ash.
115. Green Ash.
116. Red Ash.
117. Button Bush.
118. Elder.
119. Sheep-berry.
120. Indian Currant.
121. Wolf-berry.
123. Trumpet Honeysuckle.
124. Yellow Honeysuckle.
125. Small Honeysuckle.

## ORIGIN OF THE NEBRASKA TREES AND SHRUBS.

A close study of the foregoing facts as to the distribution of our woody plants shows that nearly all have probably migrated to the plains from the east. They have in some cases done no more than to get a little foothold in the extreme southeastern counties, to which they have come from the heavy forests of Missouri. A few have doubtless crossed the Missouri river from western Iowa, although this number is evidently very small. Nearly all our trees have come up the Missouri bottoms and spread from the southeastern corner of the state west and northwest. Possibly a few may have come up the Blue river from Kansas, but these must eventually be traced to the Missouri river bottoms at the mouth of the Kansas river.

The trees and shrubs which are found only in the western part of the state unquestionably came from the Rocky mountains, and have spread eastward to their present limits. Only one of these, the Buffalo Berry, has spread itself over the whole state. There is a probability that a careful examination of the bluffs of the Niobrara, Platte, and Republican rivers will show several more of these Rocky mountain plants, which have come down with the river currents. It is singular that so few of the western trees and shrubs have come down the streams, especially as prevailing winds are also from the westerly parts toward the east. One certainly would have supposed it much easier for the western trees to come down stream, and with the wind, than for the elms, ashes, plums, etc., to have gone up the streams against the prevailing winds.

I suspect that the meaning of all this is that eastern conditions are slowly advancing westward; that such climatic and other changes are slowly taking place upon the plains as favor the eastern rather than the western trees. With our present knowledge, it now appears probable that the western trees are slowly retreating, while the eastern species are slowly pushing their way westward.

## SPECIAL REQUEST.

In order that our knowledge of the native trees and shrubs of Nebraska may be made as complete as possible, I request the aid of observers in different parts of the state. Farmers, horticulturists, teachers, and others interested in the subject are invited to correspond with the undersigned. Twigs and leaves of every native woody plant in every locality are desired. These should be large enough to serve as good specimens (say 8 to 10 inches long), and, where possible, should be accompanied with flowers and fruits. When tightly rolled in a newspaper they may be sent through the mails at the rate of one cent for each ounce. Address all packages to

CHARLES E. BESSEY, *Professor of Botany,*  
*State University, Lincoln, Nebr.*



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     " Buckthorn, 67  
     " Rose, 102  
     " Sumach, 56  
     " Yellow Oak, 9  
 Mahogany, Mountain, 16  
 Maple, Ash-leaved, 61  
     " Mountain, 58  
     " Red, 59  
     " Silver, 59  
     " Soft, 59  
     " Sugar, 60  
 Menispermum canadense, 49  
 Mocker-Nut, 26  
 Moonseed, 49  
 Morus rubra, 44  
 Mountain Mahogany, 96  
     " Maple, 58  
 Mulberry, Red, 44  
 Negundo aceroides, 61  
 New Jersey Tea, 70  
 Niellia opulifolia, 92  
 Nine-bark, 92  
 Oak, Black, 13  
     " Bur, 7  
     " Laurel, 14  
     " Low Yellow, 9  
     " Post, 6  
     " Red, 10  
     " Scarlet, 11  
     " Scrub, 12  
     " White, 5  
     " Yellow, 8  
 Ohio Buckeye, 57  
 Ostrya virginiana, 15  
 Papaw, 50  
 Parthenocissus quinquefolia, 75  
 Pig-Nut, 27  
 Pine, Yellow, 1  
 Pinus ponderosa, var. scopulorum, 1  
 Pirus coronaria, 103

Plane Tree, 45  
 Platanus occidentalis, 45  
 Plum, Chickasaw, 87  
     " Sand, 87  
     " Wild, 87  
 Poison Ivy, 55  
 Poplar, Balsam, 38  
 Populus angustifolia, 39  
     " balsamifera, var. candicans, 39  
     " monilifera, 40  
     " tremuloides, 37  
 Post Oak, 6  
 Prairie Rose, 99  
     " Willow, 34  
 Prickly Ash, 52  
     " Gooseberry, 70  
     " Rose, 100  
 Prunus americana, 87  
     " chicasa, 87  
     " demissa, 90  
     " pumila, 88  
     " serotina, 91  
     " virginiana, 89

Quaking Asp, 37  
 Quercus alba, 5  
     " coccinea, 11  
     " ilicifolia, 12  
     " imbricaria, 14  
     " macrocarpa, 7  
     " muhlenbergii, 8  
     " nigra, 13  
     " prinoides, 9  
     " rubra, 10  
     " stellata, 6

Raspberry, Black, 94  
     " Red, 93  
 Red Ash, 116  
     " Birch, 21  
     " Bud, 111  
     " Cedar, 3  
     " Elm, 42  
     " Maple, 59  
     " Mulberry, 44  
     " Oak, 10  
     " Osier Dogwood, 78  
     " Raspberry, 93

- Red Root, 71  
*Rhamnus alnifolia*, 67  
     " *caroliniana*, 69  
     " *lanceolatus*, 68  
*Rhus canadensis*, var. *trilobata*, 56  
     " *copallina*, 54  
     " *glabra*, 53  
     " *toxicondendron*, 55  
*Ribes aureum*, 84  
     " *cereum*, 82  
     " *cynosbati*, 80  
     " *floridum*, 83  
     " *gracile*, 81  
 Rock Elm, 41  
*Rosa arkansana*, 99  
     " *blanda*, 98  
     " *fendleri*, 101  
     " *nutkana*, 100  
     " *setigera*, 97  
     " *woodsii*, 102  
 Rose, Climbing Prairie, 97  
     " Low, 102  
     " Prairie, 99  
     " Tall, 101  
 Rough-leaved Dogwood, 77  
*Rubus occidentalis*, 94  
     " *strigosus*, 93  
     " *villosus*, 95  
 Sage Brush, 126  
*Salix amygdaloides*, 30  
     " *cordata*, var. *vestita*, 36  
     " *humilis*, 34  
     " *longifolia*, 32  
     " *lucida*, 31  
     " *nigra*, 29  
     " *rostrata*, 33  
     " *tristis*, 35  
*Sambucus canadensis*, 118  
 Sand-bar Willow, 32  
 Sand Cherry, 88  
     " Plum, 87  
*Sarcobatus vermiculatus*, 46  
 Scarlet Oak, 11  
 Scrub Oak, 12  
 Service-berry, 126  
 Sheep-berry, 119  
 Shell-bark Hickory, 24  
*Shepherdia argentea*, 86  
 Shining Willow, 31  
 Shoe String, 109  
 Silver Maple, 59  
 Slippery Elm, 42  
 Small Honeysuckle, 125  
     " Service-berry, 107  
*Smilax hispida*, 4  
 Smooth Gooseberry, 81  
     " Rose, 98  
     " Sumach, 53  
 Snowberry, 122  
 Soft Maple, 59  
 Speckled Alder, 18  
*Staphylea trifolia*, 66  
 Stinkberry, 68  
 Strawberry Bush, 64  
 Sugar Maple, 60  
 Sumach, Dwarf, 54  
     " Low, 56  
     " Smooth, 53  
 Summer Grape, 72  
 Swamp Elm, 41  
 Sycamore, 45  
*Symphoricarpos occidentalis*, 121  
     " *racemosus*, var. *pauciflorus*, 122  
     " *vulgaris*, 120  
 Tall Bigelovia, 129  
     " Rose, 101  
*Tilia americana*, 51  
 Trailing Strawberry Bush, 65  
 Trumpet Honeysuckle, 123  
*Ulmus americana*, 41  
     " *fulva*, 42  
     " *racemosa*, 41  
*Viburnum lentago*, 119  
 Virginia Creeper, 75  
*Vitis aestivalis*, 72  
     " *cordifolia*, 73  
     " *riparia*, 74  
 Waahoo, 63  
 Walnut, Black, 23  
 Water Elm, 41  
 White Ash, 114  
     " Elm, 41

White Oak, 5

Wild Black Cherry, 91

“ Black Currant, 83

“ Crab-Apple, 103

“ Plum, 87

“ Red Currant, 82

Willow, Almond, 30

“ Beaked, 33

“ Black, 29

“ Diamond, 36

“ Dwarf, 35

Willow Prairie, 34

“ Sand-bar, 32

“ Shining, 31

Witch Hazel, 85

Wolf-berry, 121

Wormwood, 128

Xanthoxylum americanum, 52

Yellow Honeysuckle, 124

“ Oak, 8

“ Pine, 1

## APPLE STATISTICS.

HARTLEY—I concluded that there is one thing that I wish to have brought up here: that is a matter of statistics. We need it for a guide in our own planting. I have made mistakes and been misled by special trees. The Welhouse orchards are probably the largest and most successful of any west of the Missouri river. They have been more profitable than a national bank. They are the only orchards where systematic account of everything has been kept. Everything is arranged to get the most possible dollars out of the least expenditure of dollars. He very kindly opened his books for me; let me go through them, and were it not for the fact that I promised him that the figures of these accounts should not get into print, I should give you them. In regard to the number of trees, there were somewhere near 50,825, but that does not account for the trees that are missing. The policy was to keep the ground in grain the first five years. The orchards are in Leavenworth county, Kansas. From 1880 to 1890 the whole thing, 440 acres of orchard, was under one management. The figures showing the amount of apples, amount of picked apples and culls, etc., are very instructive, but of course I cannot give them to you. They cull their apples much more closely there than we do here. They make everything go at the fastest possible rate; in their new orchards of 450 acres they plant with fourteen men and three teams just one hundred acres a day, or, in other words, 450 acres of orchard in four and one-half days. The trees look as though they had been fired into the ground with a gun, but everything seems to grow for Welhouse. I would like to draw attention to one thing in regard to figures we have been using at different times in our statements as to the profits in orcharding. Their heaviest crop was 42,470 bushels and they had nearly 51,000 trees; something less than one bushel per tree. Yet that crop paid for the entire plant. When you sell trees you talk about five or six bushels per tree; you don't tell the people that in large orchards the trees will not average that much; that's what tree men don't do, and that's what they ought to do. One of your nurserymen told me that he sold the crop from his thirty-acre orchard for one thousand dollars. How much is that per acre?

\$33.33; and I want to say that that is much better than the profits on raising corn. What is the use of talking about \$1,000 per acre.

HARRIS—In regard to the Welhouse orchards, do you know what varieties he has planted?

HARTLEY—Ben Davis, Winesap, Jonathan, Janet, Grimes's Golden.

DAY—I want to tell you men one thing: Let a man tell the absolute truth and people will place so little credence in it that he will have to give up the road; he cannot sell his trees.

DUNLAP—I saw a man not long ago who said he was representing the Nebraska Horticultural Society; I was not sure whether it was Taylor or Day. I inquired more fully about it, and he said he was sure the trees came through the Nebraska Horticultural Society at Lincoln. [Laughter.]

DAY—In regard to a seedling apple we had last fall at the fair; it seems that it was ruled out as not being a seedling, but something else. Mr. J. L. Brown here has something to say regarding it.

BROWN—I might state that I brought ten of the apples to the State Fair last fall; I was satisfied that the statements sent with them were all straight and correct. The committee said that the apple was Cooper's Early White, and that they would not make an award. I thought perhaps they might have cast some reflection on me, but did not care for that. I looked up the tree and find that it is not a Cooper's Early White; it looks as though it might have been broken off at one time; the foliage is much heavier than that of the Cooper's; the limbs do not come out so square as the Cooper's.

DAY—I move to pay this seedling premium.

PRESIDENT—I do not know as this would be a good thing to do; it is hardly the thing to go behind the returns of what a committee does after its work has been accepted.

HARTLEY—I think we have all the proof needed; I do not see why people should be subject to technical tests.

PRESIDENT—It does not seem to me that we should infringe upon the rights of our committee.

HARTLEY—The right of the Society is greater than that of any committee.

DAY—Am satisfied that the premium is due her.

SLAYTON—She should not be put to further trouble. It is proper for our Society to give a name for this apple.

HARRIS—I was present when the committee passed upon that apple; I thought it was a Cooper's Early White. I think it is perhaps a little more tart than the Cooper's; but it was not quite so ripe. The apple certainly deserves a premium.

GOODRICH—I move you that an order be drawn on the Treasurer for the amount of the premium, and the same paid to this lady. Carried.

GOODRICH—I move you that we take up the revision of the premium list at 8 o'clock to-morrow morning. Carried.

SLAYTON—I move that we take up the revision of the fruit list at 9 o'clock to-morrow morning. Carried.

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### MORNING SESSION.

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LINCOLN, NEB., January 14, 1892.

Called to order by President Taylor. Minutes of yesterday's session read and adopted.

TAYLOR—Our order of business for this morning is as follows: talk on experiment stations; then the revision of the fruit list; then at 10:30 the discussion which was down for Mr. Brown and Mr. Hogg, and at 11 o'clock, report of committee on revision of the premium list, rules, and regulations. The first thing is on the experiment stations. We speak of there being horticultural experiment stations, and of their being under the control of the State Horticultural Society. That is true to a small extent: the Society has never given a cent for such a thing as an experiment station, although some of the individual members have. No Horticultural Society money has ever gone into such a thing. Last year the regents of the State University authorized us to have and use about \$150 to found stations. This money was placed in Professor Bessey's hand; after that he wrote to me asking me if I would take hold of the work for him. I agreed to do so. Then the Society on its part appointed five or six or seven stations and authorized me to fill up the number to twelve. Some of this was done a year ago now. I was authorized by Professor Bessey to contract debts amounting to \$150, and the Society, when the first stations were appointed, agreed that quite a numbers of the members would give some stock from their own grounds. I bought quite a



number of trees from Bloomington, which, in addition to that sent in by our members, I divided up amongst the different stations. In some cases the results have been very satisfactory; in others they have not done so well. Those stations in the eastern part of the state did not do much, while all of those west report everything doing well. I have here reports from each station which came in in June. Last year it was my intention to visit part of these stations, but circumstances were such that I could not go. In two or three cases stock arrived in a bad condition at the stations. With but these two or three exceptions the stock arrived in good condition, and, after being planted, grew and made a fairly good stand. The Society has never voted any money for these purposes. Of course it was impossible to get stock in the fall to ship in the spring. We bought some in Illinois, some top-worked apple trees; these got in as early as they could be shipped to me, and it made it a little late by the time they were unpacked and repacked here. I think it would be a good idea to have this stock hereafter sent direct to the stations, as it will save a good deal of time. We supplied all the established stations with stock.

GOODRICH—In looking over the trees out at the farm near this city, I think it is a shame to see the way they are trimmed. It is the sense of this Society that low-headed trees are the best.

TAYLOR—The trees that you saw are just as they had been pruned prior to our receiving them.

BARNARD—My motion yesterday was that this morning we take up the reports from these experiment stations; where they are located; what stock was planted; how it did, etc. I brought up the matter to know if they were doing any good.

DUNLAP—The report that I have made up for the August meeting. I call this the Ninth District; it is situated on the southwest quarter of section 24, town 19 north, of range 51 west. I planted on this land in the spring of 1889, cherries, plums, etc.; these trees are doing as well as any trees could. Wragg cherry trees fruited this spring that were planted in 1889. This spring, on April 27, I received some bundles of trees and plants. The apples and cherries were quite dry; had lain too long at the railroad station. I puddled them well. I can also make a report of the wild fruits if the Society wish it.

HARRIS—I have not a report with me. I will say that the stock arrived in very bad condition indeed; the packing was entirely off the roots; the trees were entirely dry, and I did not suppose that any of them would grow. I did the best I could with them, and of what trees did grow there are part of the labels that I cannot make out. I have a list of all the stock that I can tell, and will send it in at any time it is wanted. Will say further that when once goods are catalogued and sent to station masters, it seems to me that it is useless to continue sending on those varieties to that place for further experimentation. We in the eastern part of the state want something new; and if we cannot get it, it is not necessary to send the old tested kinds.

JENKINS—I have no report. My land is good tillable land about eighty feet above the river. I have a neighbor who lives about two miles back from the river; he has written up a short report which he asked me to hand to Mr. Day; I will read it.

DUNLAP—The trees I got had large roots, but the tops were small.

REED—I want to say that the trees I sent were good trees.

#### REPORT OF R. N. DAY.

Late in April, 1891, a bill of stock was received from our worthy President. At the time I was not able to look after anything, but was informed that it was in rather a dry condition. I gave direction to put it all in soak for two or three days and keep the roots very wet and the tops shaded. At the expiration of the time allowed for resuscitation I ordered the stock to be planted with the utmost care. In a few days' time I got around, and from that time took the care of the stock myself with the following results:

#### *Apples, Root-grafted.*

List of Trees.	Number Growing.
4 Dunlap .....	4
1 Arkansas Black .....	1
1 Maiden's Blush .....	1
2 Salome .....	2
3 N. W. Greening.....	3

#### *Apples, Top-grafted.*

2 N. W. Greening.....	1
1 Kansas Traveler.....	1

3 Grimes's Golden.....	3
1 Glass.....	1
1 Jonathan.....	1
1 Longfield .....	1
1 Talman Sweet.....	1
1 Black Arnot.....	1
1 Garfield .....	1
1 Hiberna.....	1
1 Charlottenthaler.....	1
1 Patton's Duchess.....	1

*Cherries.*

1 Amorelle.....	1
1 26-Orel.....	1
2 Wragg .....	2
1 Spate Amorelle.....	1
1 23-Orel.....	0

*Strawberries.*

12 Racster.....	8
8 Great Pacific .....	8
8 Parker Earle .....	1
12 Lady Rusk.....	10

*Raspberries.*

12 Tribble.....	3
20 P. R. (So marked).....	15

*Dewberries.*

10 Muskingum .....	8
10 Bartle .....	5
1 Industry Gooseberry .....	1
1 Market Garden Grape.....	1
1 Beadle.....	1
1 President Lyon .....	1

## REPORT OF C. W. GURNEY.

CONCORD, NEB., Jan. 5, 1892.

R. W. Day, Secretary—DEAR SIR: This experiment station received last spring from the Society the following bill of stock:

*Apples*—Five to six feet high, top-worked on Whitney—1 Winnebago, 1 Black Annette, 2 Glass, 1 Jonathan, 1 Patton's Duchess No. 2, 1 Roman Stem, 1 Kosso's Trovite, 2 Grimes's Golden Pippin, 1 Salome, 1 Talman Sweet, 1 Maiden Blush, 2 N. W. Greening, 1 Hibernial, 1 Charlottenthaler, 2 Black Twig, 1 Longfield, 1 Yellow Transparent; of yearlings, root grafted, 2 Wythe, 1 Fink, 4 Dunlap, 1 Arkansas Black, 1 Wealthy, 1 Iowa Keeper, 1 Utter's Red 1 Allen's Choice.

*Cherries*—2 Spate Amorelle, 2 Wragg, 1 Amorelle, 1 Ostheim, 1 23-Orel, 1 26-Orel.

*Small Fruits*—1 Industry Gooseberry, 1 Fay Currant, 12 each Racster, Haviland, Lady Rusk strawberries, 12 each Thibble, Palmer, and Muskingum raspberries, and 1 President Lyon, 1 Early Market, 1 Blanco, and 1 Beagle grape.

This bill had been baled, but in some manner in shipment the baling had become loose and separated, except a shred of burlap. They were badly dried and badly bruised. I immediately buried them in moist earth, where they were left till about May 1st, then planted. I cut back heavily. All trees were sound. The grapes all grew finely, all the other small fruit died. Of the apples first named I lost 1 Kosso's Trovite, 1 Salome, 1 Maiden Blush, 1 Longfield, 1 Hibernial, and 1 Black Twig. Of the small apples, 1 Wythe, 1 Iowa Keeper, 1 Utter's Red, 1 Salome, 1 Allen's Choice. The balance, except the Ostheim and Orel No. 23 cherry, lived and made a fair growth.

They are planted on a high piece of ground that has been several years in corn. This ground slopes slightly from the center each way north and south.

The top working in many of the trees has grown over so smoothly as to be undiscernible except to the best practiced eye.

Respectfully,

C. W. GURNEY,  
*Station Superintendent.*

#### DISCUSSION.

DUNLAP—I do not want to blame Mr. Taylor nor any other nurseryman; but there is no necessity for losing trees shipped by freight. I once sent to Council Bluffs for apple seedlings; told the firm that I wanted them picked well, and described what I meant by good packing; sent some extra money along, but they packed the seedlings as they chose and sent back part of the money. The next time I was

asked by them to buy apple seedlings I told them if they would pack the way I wanted I would order, but as they had not done so before, I feared they would neglect it again. I want everything packed very heavily; then I can send trees 400 miles without the least fear of damage.

BARNARD—I believe these directors should have the privilege of asking for what they want. This distribution of stock is a grand fraud. I believe it would be a good idea to have this money divided amongst the directors, and let them buy what they need for trial.

DAY—It would be a pleasure to me to conduct an experiment station if I could get what stock I wanted; but it is no use to experiment with something we have used before—something perhaps that has caused us a goodly outlay of money and brought in but small returns. In the present stock that I have charge of, there is a good deal that is of no use at all. I believe I could impart much information in this way. There is much stock that I would like to experiment with this coming spring, and I am very anxious to start these fruits. I have every reason to believe that money put into this experiment station business will pay, if they are conducted right. I am looking south for our winter apples; many are looking to the north for them, but I do not believe that will win. I can do this experimenting just as effectually as if I were fifteen years younger. I would rather not take stock that I have already.

STEPHENS—I am much interested in this. Regarding stock, it sometimes happens that trees lie several days on the platform, at the railroad station, and that dries them out worse than a hundred miles of travel for every day on the platform. At the Box Butte station the stock was received in good condition; small fruits especially so. I sent the director of that station a tree case packed full of an assortment of trees and plants. They did very nicely. In regard to how and what we shall plant, it would be all the same to me if we left it entirely to the directors. The Society should make up a list of what we should plant.

TAYLOR—(Reads report of Sidney station.) Now, as to how this should be carried on, we must bear in mind that we have in this state two different conditions of things to contend with: In the eastern part of the state, where the older varieties have been tested, we must certainly try the new varieties as they come out; farther west

the old varieties have not been tried, and there it is the work of these stations to ascertain just what of the old varieties will do for that region. We want to have these things in mind. The Society should appoint someone to represent it in the selection of stock for the different regions; until it does so, of course I am willing to act in that capacity. Let these station keepers send in, stating what they want; and when the stock is ordered, have it go directly to the keepers. If the arrangement should be made as I have suggested, there would be no expense attached to it, as I would pay the postage. It seems to me that something of this kind should be done. Let there be a representative of the Society to act with a representative of the State University. We do not expect to have men unless they are acquainted with what is needed.

BARNARD—I move that the Society recommend that this money be divided as nearly as possible amongst, and expended under the direction of, the keepers of the stations; such division to be made by the representatives of the Society (who shall be the president of this Society) and the representative of the State University. The point is to allow each keeper of a station to have his own selection.

MASTERS—It seems to me that this is a move in the right direction. Probably many of you remember that for the last thirty years about the distribution of seeds from the Patent Office at Washington. The object was to send out nothing but new seeds; but seedsmen got around the management and sold them all the old seeds that they could not get rid of in their trade. I am in favor of having these keepers of the experiment stations making their own selection of trees and plants. If they are not capable of this selection, they are not capable of running the station.

HARRIS—I think the selection should be left to the station keepers. With us in the eastern part of the state, we have tried most all of the old varieties, and we want something new. I think this experimenting should not be confined to fruits alone; we want flowers, and ornamental shrubs as well.

STEPHENS—It would be a good thing to remember that we are not experimenting with our own money. After we get using our own money, it will be well to allow keepers of the experiment stations to select what they want for trial; but for the present, as long as we de-

pend on University money we must not run wild in our experimentation. The University should be consulted somewhat.

DAY—I conceive this to be one of the great points in the success of horticulture in Nebraska, if we can be furnished with what is needed to conduct these experiments. There are men who are interested in horticulture in this state, who if they can be supplied with the proper varieties, can impart new vigor to experimentation. The adapted and the unadapted fruits will be sifted out more rapidly than under the old way of every man making his own experiments at his own cost and loss. Motion carried.

PRESIDENT—I want to say something in regard to this money: the University gave us last year \$150; and this year will give \$300. Now, if we cannot get \$2,000 to \$3,000 from our next legislature we are no good. Last winter Mr. Stephens and myself had a bill introduced for this purpose, and had the promise of enough members to pass it. When it came up it was attacked by the member from Nemaha, and killed. From the feeling of the men who were in the legislature that time, I am sure we can get some money to help us out. This year with \$300 we cannot do much, but can do something. Next winter cannot we get after the legislature and get an appropriation? It seems to me from now on until the meeting of the next legislature would be a good time to agitate this matter. In Kansas they give \$2,000, and there is no good reason why our state should not give at least as much.

JENKINS—Would it not be a good plan to drop part of the stations until we can get some more money.

PRESIDENT—The only objection to dropping any of them is that when we talk this matter with the members of the legislature, it does a great deal of good to say that these stations are located all over the state. If there is a station within fifty or seventy-five miles of the home of a member, he will say, that will be a benefit to me and I will support the measure. We can keep up all that are now established, but will have to restrict the experiments pretty much. We count the University farm as one station, and it will not be necessary to set aside any money for it. With eleven stations, I think we are coming with pretty good claims on the legislature for money.

REED—We can all aid in securing this appropriation. The report of fruit growing and selling ought to be thoroughly looked after; it

is important that we show to the legislature the large amount of business done in the fruit business in this state, and then it will be no trouble to get money to aid in establishing these stations.

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## SHALL WE ORGANIZE LOCAL HORTICULTURAL SOCIETIES?

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BY J. L. BROWN.

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I think we should. The district school is the nursery of the college. There is the place where the young are trained before they are advanced to the higher place. They pass from the college into active life. They—some of them—go back to the district school, teaching others and fitting them for the higher places. This is the way that the benefits of our educational institutions are distributed to our people.

Now it seems to me that the State Horticultural Society can extend its influence to the people in very much the same way. I take it that the common school awakens a desire for something beyond, something higher; hence the college becomes a necessity. It is the factory where the material is taken as it comes from first hands, is finished and returned to us, fitted and ready for use. I believe if every county had a live wide-awake horticultural society, the membership of this Society would be vastly increased. To say the least, the attendance at its meetings would be greater. It is the people in the rural districts that we need to get at and interest in our work. They need the advice and instruction that this Society can give. They need our encouragement and knowledge in making permanent improvement of their homes. There ought to be a home improvement society in every school district. They should hold semi-monthly meetings at the homes of the members. At these meetings they could compare notes and discuss projected improvements of the home where the meeting is being held. Together they could look over the farm, garden, and orchard; see where changes in methods of care and culture would be proper. By thus doing many mistakes might be avoided in culture, planting, improvement, etc. It would also encourage sociability, and engender a kind of fraternal feeling in the neighborhood. Many ideas would be



brought out and developed by such meetings which if it were not for them would never be thought of. Such an organization, if rightly handled, would open the way for improved methods in agriculture and horticulture. It would prepare the way for teaching horticulture in our schools. I believe the rudiments of horticulture, especially, should be taught in our common schools. Children take kindly to the work and enjoy it. Teachers love to tell—at least good ones do—of what they know and have observed about trees, plants, etc., and become much interested in their subjects as their pupils advance in knowledge. I candidly believe it would be the means of developing a higher grade of citizenship.

Show me the man who loves his home, and is engaged in beautifying and improving it, surrounding the homestead with fruit and ornamental trees, shrubs, and flowers, and I will show you a good law abiding citizen, a man who loves and respects the rights of his neighbors, "and keeps his hogs and cattle up." The last named qualification almost "makes a saint of a man" in my eyes. On the other hand, the man who cares nothing for these beautiful things, simply exists—cares nothing for the happiness of his family and less for the rights of his neighbors. He sees nothing beautiful or worth striving for in either art or nature. His children just breathe because they cannot help it, become disgusted with "life in the country," and leave the place with no feelings of regret, seeking employment in other callings, often becoming criminals at an early age. What are we here for, anyway? Shall we make our society far reaching and beneficial to the people? Shall we use it for the true interests of horticulture in our state, or shall we be as a clam? Would not the people be better posted in our line of work by attending meetings of similar societies? Our reports, containing valuable papers and discussions, would be better distributed than they are now.

It seems to me there can be no real good reason why we should not have local horticultural societies, and the more the better.

#### DISCUSSION.

**WILLIAMS**—This paper is one of great importance; the organization of local horticultural societies is of great benefit to all the people. In Mills county, Iowa, we have a fine local society; we got the business men there to endorse our movement; have now over one hundred

members. We have monthly meetings on the second Wednesday of each month. The papers and whatever is done at these meetings is right to the point.

REED—This is a move in the right direction. The more information we can get before the people, the more interest will be manifested.

MASTERS—I have always advocated a system by which our local county societies should be annexed to our state society. I believe it is the only way to make everything successful. The only way we can keep up our county societies. If each county society were represented in the state society, you could get up an interest that you cannot get in any other way. We have a county society—a kind of dead society! We tried to get representation in the state society but failed. There was a bill presented to our legislature two years ago last winter for the purpose of organizing a state board of horticulture; I think it was just what we needed; it made officers of the county societies members of the state society. It is the only system in my opinion by which we can make a success of county societies in connection with the state society. I remember of reading of a county society in Illinois—in Warsaw, I believe—where they held their monthly meetings in the orchards of the members. The result was a very fine influence upon those members in whose orchards these meetings were held; it induced them to clean up and keep down the weeds. If my society were to meet in my orchard, I know I would be at work there for a full month before the meeting! I am in favor of a state society after the plan mentioned in the bill of two years ago, which was defeated by our legislative committee. Mr. Dunlap has a copy of it; I should like to hear it read.

MORSE—I am a member of the Douglas County Horticultural Society, and I think that this move that Mr. Masters speaks of is a move in the right direction. I think that the general character of the local societies would be benefited by this kind of state society. It is a difficult matter to get sufficient interest to bring out exhibits. There is very fine fruit grown in Douglas county, and I do not think the exhibits from there are large enough.

WILLIAMS—One of the encouragements the state society could give to the county society is the distribution of reports; the secretary of the state society send a number to each secretary of a local society, and thus they are mutually beneficial to each other.

YOUNGERS—I would like to know how many horticultural societies there are in this state? In our county we have a horticultural society, but it is hard work to get out even a corporal's guard at our meetings. What are your methods of getting them out? "Yes," they will say, "we will come," but that is the end of it.

TAYLOR—I think that of course every good thing does not come from some other place, yet Iowa is a very good example of what can be done in this line. They had local district societies covering most of the state—the Western, Eastern, Northern, and Northwestern Societies. These started to get clear down to the people; it worked slowly at first, but after these local societies began to work with county societies under them it spread very fast. To-day the Western Iowa Society is considered even better than the state society. I think the better plan is to have local district societies embracing several counties, and after these begin to get along nicely, organize your county societies.

DAY—It seems to me, as Brother Masters says, that you want to combine business and pleasure at these meetings. I noticed in Harrison county, Iowa, where they had farmers' clubs organized, they would let in but twelve members, so that one meeting each year(?) was held at the residence of each of the members.

TAYLOR—(Reads from pages 41 and 43 of the report of 1890).

YOUNGERS—I move to appoint a committee of three, with Mr. Jenkins as chairman, to report at our summer meeting in regard to forming local district and county societies. Carried.

#### REPORT ON PRESIDENT'S ADDRESS.

The chairman of the committee on President's address then read the recommendations adopted.

HARRIS—I move to accept the report and discharge the committee.

BARNARD—I move to amend by having the Board of Directors select the experts.

YOUNGERS—I accept the amendment.

MORSE—I have had experience in large floral exhibits, and I am not in favor of having but one judge. It is the almost universal rule to have three.

YOUNGERS—One expert judge who understands his business can do the work much more easily than can three, as nearly always two of them are in the way of the one that does the work. I would rather

have Mr. Masters judge my apples than any other three men in the state, even if his own fruit were in competition with mine; I know he would do it right.

MORSE—I agree with you there. The trouble is with one expert judge that it is hard to get a man who can fill the place. It is often the case that one man will see good and bad points about certain fruits and flowers which one of the others will overlook; and it would be so with the other two judges. So far we have had but little competition; but when the competition is keen, then the one judge feels his need of help.

MASTERS—I am opposed to the one judge system. If I were to be judge, I would not be there at all. The condemnation of judges is always great, and it is more than one man can bear. One judge may discover perfections and imperfections, as our Omaha friend has said, that the other two would not see. By consulting together they certainly can do better than one.

TAYLOR—I have had the appointing of the judges for the reason that nothing has been settled. We have always had three judges until this year I said I would like to have one judge for each class. There never has been as little trouble as this year. You can hardly ever get all three of the judges to stay at their work all the time until it is done, but they have to be paid just the same; if you hire one man, he knows the work must be done, and that he has to do it. Florists are as a rule very jealous of each other, and most of the complaints come from them. Our one judge this year was perfectly satisfactory to them. Before there was no end of pulling and hauling among them, but this year everything went off smoothly. Nearly everyone is in favor of one judge.

MORSE—Did the one judge system apply to all?

PRESIDENT—It did. We had a lady to judge cut flowers, and a man to judge the flowers and plants.

MORSE—I would like to say, Mr. President, that inside of a very few years the flower exhibits will be much larger than now. We are only now just beginning to raise up flowers as they should be. Notwithstanding the supposed difficulty of obtaining judges who are competent, I can name in a few minutes plenty of men whom I would not be afraid to let pass judgment upon my flowers.

Original motion and amendment carried.

MORSE—Mr. President, our regulations prohibit us from using any flowers in floral designs, wreaths, etc., that are not of our own production; this is not right, as it often happens that we need a certain kind of flowers to fill in with, and we may be short of that and have plenty of some other kind. If we could be permitted to use flowers grown elsewhere in case we have not the kinds we wish to use of our own growing, we could make a much finer exhibit. Hence, I would make a motion to change the regulations something about like this: "If any person shall exhibit for competition any fruits, flowers, or other articles not of his or her own production EXCEPT *in floral designs, wreaths, baskets of cut flowers, hand bouquet, flat bouquet, and pyramid, as mentioned in premium list; (these aforesaid may be purchased outside the state, but no person living outside the state shall be entitled to compete)*, said exhibitor shall forfeit," etc.

MOSHER—I move, Mr. President, that we incorporate this into our Rules and Regulations. Carried.

SLAYTON—I rise to make a motion, but wish first to make a few preliminary remarks. Our Constitution is faulty, inasmuch as it permits any and everybody to join it, no matter whether or not he or she may be engaged, or even interested in, horticulture. I have noticed this for some time, and to avoid in future such scenes as we had at our election of officers yesterday, I have written up an entire new Constitution which I shall read first for your consideration. (Reads.) Mr. President, I move the adoption of this Constitution in place of the one we now have.

CARPENTER—There is a conflict between the Code and the By-Laws. The Code says we shall have three directors; it is in language something like this: There shall be a President, two Vice-Presidents, a Secretary, a Treasurer, and three directors. I move to leave this to a committee.

HARTLEY—This Constitution will cut out the very element it is intended to cut out, and it will keep up the character of this Society as a Horticultural Society.

BARNARD—I move to amend this Constitution by saying that the voting members shall be the life members.

REED—I move that that last clause in Article III in regard to life members be stricken out. Carried.

YOUNGERS—I think that the bond for the Treasurer should be \$12,000.

DAY—I move that be added.

PRESIDENT—And that the Secretary shall complete his report. That the fall meeting should be held at the time of the fair. (Active and Associate Members: Life members are the active, or voting).

Rising vote—Ayes, 23; noes, 8.

Constitution as amended was adopted.

Report of committee on premium list adopted.

Summer meeting to be held at Nebraska City.

BARNARD—Now in regard to some one to go to the World's Fair in 1893 as horticultural superintendent. Let us take it up now. I move to take it up now.

STEPHENS—Our state is at present divided in politics. We have two governors, and it is hard to tell which of them will be successful. It seems to us that this Society should be in harmony with the powers that be. I move you that we leave this matter with the Board of Directors to be acted upon by them after we ascertain who will be governor.

GOODRICH—I do not think that politics should cut any figure; this is not political business. We should appoint the best man we have in the state for this business, irrespective of politics. I think this body is right in selecting the man it wants for this position.

DAY—Greer is a very conservative man. It seems to me it will be done as the Society wishes. This is the last chance to act; now is the time to select this man.

JENKINS—I nominate Mr. J. H. Masters as the man to be recommended for the position of Superintendent of the Nebraska Horticultural exhibit at the World's Columbian Fair.

MOSHER—For the same position I nominate Mr. G. J. Carpenter.

Ballot—Masters, 17; Carpenter, 14. Whereupon Mr. Masters was declared the choice of the Society for the position of horticultural superintendent of the Nebraska exhibit at the World's Columbian Fair, and his name is to be recommended to the Nebraska commissioners for that position.

Motion to leave the papers on evergreens on the table until the summer meeting. Carried.

Adjourned.

## AFTERNOON SESSION.

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LINCOLN, NEB., January 14, 1892.

Called to order by President Taylor.

### REPORT OF THE ORNITHOLOGIST.

Professor Bruner, the committee on ornithology, being absent, G. A. Coleman took his place, reading the following very instructive paper:

### BIRDS AND MAMMALS.

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BY GEO. A. COLEMAN.

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Almost every one is aware that a few hawks and owls are in the habit of visiting the poultry yard, and occasionally carrying off a young chicken or duck; and that wolves, skunks, weasels, and rats are addicted to the same habits; that wolves, wild cats, and bears, are sometimes caught in the act of making a meal of a nice young pig or lamb. We also know that crows and blackbirds sometimes pull up young corn, rob hen's nests, bird's nests, and commit various other depredations of an unseemly nature. We have noticed that robins, blue jays, cat birds, and woodpeckers are fond of visiting our cherry trees, apple trees, and berry bushes; and from the fact that we occasionally see them taking a nice ripe cherry or berry, we imagine that they are destroying several bushels of fruit that might otherwise be made to swell the number of dollars in our pockets. But very few farmers and horticulturists are observers of the fact that there are a great host of sparrows and small birds that have an almost exclusive diet of insects, and that the very species which they so heartily condemn are, to a great extent, insect eaters. It has only been in the last few years that anything like a systematic investigation of the food habits of our birds and mammals has been carried on. In 1886, the Department of Agriculture at Washington established a Division of Economic Ornithology and Mammalogy for the purpose of investigating the food habits of the birds and mammals of the United States,

and of also studying the distribution of species, both of which are of great value to the agriculturist and horticulturist. Investigation of the food habits will tell us what birds and animals are beneficial, and what species are injurious to agriculture. The primary object of mapping the geographic distribution of species is to ascertain the number, positions and boundaries of the natural faunal and floral areas—areas which are fitted by nature for the existence of certain native animals and plants, and which consequently are adapted for the growth of certain agricultural products and for the support of certain breeds of stock. The point of greatest significance to the practical agriculturist is, that what is true of animals and plants in a state of nature is also true of them as modified by the voluntary acts of man; for every race or breed of sheep, cattle, and swine, and every variety of grain, vegetable, or fruit, thrive best under particular conditions of temperature, moisture, exposure, etc. It follows that a map of the natural life areas of a country will tell the farmer what he can expect to produce most profitably on his own farm, and also what crops will not thrive in his neighborhood, thus saving the time and cost of experimental farming, which in the aggregate, amounts to several hundreds of thousands of dollars every year.

The work of this department has consisted mainly of sending trained field agents to different parts of the country to collect birds and mammals and to report upon damage done to crops by certain species. Only one complete report, viz., that upon the English sparrow, has been published and distributed. From this report we learn that the English sparrow (*Passer domesticus*) takes seventy-five per cent of his food in corn of some form, while only three per cent of his food consists of insects, and the remaining twenty-two per cent consists of vegetables and seeds of weeds. Other bulletins on the hawks and owls, crows, crow blackbirds, and the gophers of the Mississippi valley are in course of preparation, and will soon be ready for distribution. These will all be interesting to the agriculturists and horticulturists of Nebraska, especially those upon the crow and the gophers, since there are several large crow roosts in the state, one of which, located on a small island in the Missouri river, about six miles north of Peru, Nemaha county, is the home of about 150,000 crows, and as they seem to prefer the Nebraska side of the river for feeding purposes, it means an annual loss of several hundred bushels of corn for the



farmers of Nemaha and adjoining counties. And as none of them ever die from indigestion, and as they are annually increasing to the tune of about ten crows to the pair, some means should be provided for their extermination, if it should not be proved that they are beneficial in destroying injurious insects. Although the United States Division of Economic Ornithology and Mammalogy have examined a hundred or more stomachs of crows, taken at different seasons of the year, they still need several hundred stomachs from as many different stations, in order to come to any definite conclusion, and they will furnish instructions to any one willing to assist in the collection of material. They wish, especially, to have stomachs taken in the spring when the young corn is ready to pull. As the farmers of Nebraska are the ones to be most benefited by this investigation, it seems to me proper that they should take the greatest interest in collecting the necessary material. The gopher problem is one in which every agriculturist and horticulturist in the state is more or less interested, since they are all more or less injured by their forays.

There are several species of gophers in the state, viz., the pocket gophers, striped gophers, gray gophers, and spermophiles. The pocket gophers are injurious in several ways. They annually destroy large numbers of trees, both in the forest and orchard, by gnawing the roots and killing the tree. They destroy large areas of grass in our pastures and lawns by covering it with the dirt from their excavations. They even enter the potato fields and gardens, and carry away the potatoes and other vegetables to their underground homes. The gray gophers, striped gophers, and spermophiles, which are commonly included in the term ground squirrels, injure the corn crop, and sometimes the small grains, by digging up the young shoots in order to obtain the kernel, and they also destroy a good deal of grain in the shock, both by eating it and by throwing up the dirt for their excavations in the center of the shocks, causing the grain to rot. Probably the best way of destroying these animals is by trapping and poisoning them. I do not wish to give a list of the stomachs and their contents, of the birds and mammals which I have collected and examined, at the present time; for, although I have collected a considerable number, I do not think they are of sufficient data from which to make any general statements. I think that a series of collections of the birds and mammals of our state, during each month of the year

or several years, and the examination of the stomachs of all specimens collected, would be the only way in which to determine, accurately, their food habits, and the economical value of the different species. Such an investigation would certainly be of great benefit to the horticulturists and agriculturists of the state, and would lead to inquiry and consequently to a better knowledge of the birds and mammals of our state by the great mass of people who know so little about this most interesting subject, and yet who are the very ones that should be the most interested in it, and who have the best chance for observation and study, if they would only improve it.

BESSEY—I have just received a copy of a forestry journal called *Forest Leaves*, in which there is a communication from Prof. B. E. Fernow, wherein he tells some of the things that are to be done in the way of forestry in Chicago, at the World's Fair. Each state will be asked to contribute three tree trunks, which are to be made into a colonnade around the forestry building. Each state is to furnish three trees that are typical of that state, and are not taken by any other state. He has made suggestions as to what trees each state shall use, but has made a terrible blunder in regard to Nebraska. He names as one of our trees, the black locust. Now, we all very well know that there is no such thing as a native black locust in this state, and but few transplanted ones that would come up to the proper size. It seems to me that a resolution should be made by this Society, asking Professor Fernow to correct this mistake before it is too late; and in that resolution we can suggest what tree it seems most proper for us to have. In place of the black locust we can have either bull pine or burr oak.

DAY—I would not want to go to the Fair as a black locust man, or a cottonwood man either.

HOGG—I would not like the bull pine as it grows on the poorest, sandy land; while the bur oak grows on our rich soil; would prefer to have our state represented by the bur oak.

BESSEY—Mr. President, I move you that this Society express to Professor Fernow its disapproval of the black locust as the representative of Nebraska at the World's fair lumber building; and that we recommend to him that he supply in place thereof the bur oak. And further, in communicating this to him, to state that we

have no native black locust, but have a great deal of bur oak Carried.

Mr. E. F. Stephens, of Crete, Neb., then read an interesting paper on "Pears and Plums." The Secretary was unable to procure a copy of the same for publication.

#### DISCUSSION.

HOGG—I have two Miner plum trees which I chanced to plant in a lot of wild plums; I have Wild Goose and the Weaver, but these produce more plums than any I have. I think the Miner is the most perfect plum we have. The Wild Goose never gives us much of a crop.

—A neighbor of mine has fertilized with the German Prune, and it does very well.

MASTERS—If the Miner can be fertilized with the German Prune there is a wide field before us, as these plums belong to two different families. There is very much yet to be learned in plum planting. Persons who have never planted the seeds of the Miner have no idea of the number of different seedlings they will get from them. I planted a lot of Miner pits one time for stocks; amongst the seedlings which grew up from these pits, I noticed some very nice looking trees which I kept. As the seeds were all taken from the Miner trees the fruit had undoubtedly been fertilized by some other tree, probably a worthless one. These trees I planted out along the west side of my orchard. They are now in fruiting, and some of them are as good wild plums as you ever saw. Part of them are as far ahead of the Miner as you can think; one in particular ripens about a month earlier than the Miner, and is a better plum. It would not be a firstclass plum for shipping as it is too tender, but it does fairly well for this. Those who have eaten it pronounce it the best they had ever tasted. There is another question that should be discussed, that is the subject of cross-fertilization. Professor Bessey may pick me up on this, but I would like to talk about it. The reason the Miner does not do well when planted alone is that it produces pollen at the wrong time—after it should be used. The fact that it bears big crops when set with other varieties shows that it does not fertilize itself. I noticed something last year that I never noticed before; had a few trees of what is called the Red Damson—the reddest of the wild plum family; alongside of these trees I had a row of plum trees in nursery and some of

them bore fruit. Contrary to my expectations these trees in nursery row bore fruit with a red cheek, when I supposed they would bear yellow plums. I think by close application and attention we can produce wonderful results in this matter of cross-fertilization. I have a Japan plum, the Abundance or Botan, that is the best plum I have on the place. If it does not winter-kill it will be all right—that is the only thing I fear.

BARNARD—You will remember a discussion we had here some years ago in regard to the Weaver plum. Mr. Carpenter and several others maintained that it would not bear fruit. Carpenter now says that we will learn something after a while, that it does fruit, and heavily, too. I think we ought to correct that in our next report by saying that experiments have proven the Weaver a good bearing plum.

HOGG—I had one Weaver tree this summer that was as full of plums as any tree on the place.

MASTERS—Weaver and Wolf both bear well with me. The Wayland is another good plum.

PRESTON—I would like to ask this meeting if any of the members have ever tried grafting the Lombard and the Weaver? I have done so for two years with as good success as I could wish to have with an apple. A neighbor of mine had a Miner tree which I should think was fully four inches in diameter, and it had never borne any fruit. Near it was some Lombard trees, much smaller and younger. When they began to fruit the Miner bore fruit on the side next to them. This started me to thinking, and I put some Lombard cions into this Miner tree on the other side. Last year one of these grafts bore four nice plums. Another year will tell the story.

PRESIDENT—I will name the following persons as committee on final resolutions: C. H. Barnard, G. A. Marshall, P. A. Murphy.

DAY—It seems that we have adopted a new Constitution. I would like to know if the committee will be asked to revise the By-Laws in time to get them into the new report for 1892? Would not it be a good plan to have the committee look after this?

STEPHENS—There is one thing I would like to ask: I have been paying in a dollar every year for the last fifteen or sixteen years, and I understood that all those who had paid up for a period of fifteen years were to be entitled to a life membership.

DE FRANCE—I would say that Mr. Stephens' name has been on the list of life members for several years, yet he comes up every year and pays for an annual membership. His name appears on both lists.

MASTERS—I think that resolution was passed about four years ago, and it provided that all members who had been paying for fifteen years should become life members. It must be on the records.

STEPHENS—I move that the Secretary be instructed to issue certificates to all life members, showing who is and who is not a life member. Carried.

MASTERS—Mr. Day has been paying for fourteen years. I move that he be allowed to become a life member upon payment of another dollar. Carried.

STEPHENS—Is it not about time that we began to look after space at the World's Fair?

PRESIDENT—I have a letter here from the *Orange Judd Farmer* in regard to this very matter.

BARNARD—I think it would be a good idea to look around a little in regard to getting wax cuts of fruit. Let the officers, with the Board of Directors, look after this.

MASTERS—If we are going to make a horticultural exhibit we must go into the horticultural building with our largest display.

REED—Yes; that is right; We want to go to Chicago to win.

DAY—If we have not the fruit we can buy it.

MASTERS—Let us ask for 5,000 feet, and fill it. I move to ask Chief Samuels for that amount of space in the horticultural building. Carried.

Final resolutions, read by Chairman Barnard, were then adopted.

STEPHENS—Let us all commence to ask for fruit to be sent to this Fair. If we work we can get a big display.

NEWBERRY—The columns of my paper (*The American Homestead*) are always open to make any announcements you want.

BESSEY—It is a hard matter to get these wax models of fruit; the first thing is to get somebody who can do the work. It is rather difficult work, not because it requires so much knowledge of painting, but it requires a thorough knowledge of fruits, all their peculiarities in color and form, and a desire to copy nature faithfully. The great trouble with most of these artists is that they must "dress up" everything they paint; they want to improve on nature, and the result

would be that all our apples would be very pretty, but they would all look alike. Let us look around and see if there is not some one in our Society who can paint with ordinary ability, and who can copy nature truthfully and faithfully. The modeling in wax is not difficult; I could teach anyone that in two hours' time.

PRESIDENT—Mr. Bracket is in Chicago doing this kind of work and he says he will be kept busy until 1893.

BARNARD.—I move you that money be appropriated from our treasury to pay the expense of getting these wax models of fruit made, and that the Board of Directors be authorized to get the work done.

BARNARD.—I move that this matter of procuring an artist to make the wax models be left to Professor Bessey and Mr. Masters. Carried.

BARNARD.—In the case of delegates to other horticultural societies it often happens that other meetings come before ours, and we would like to have a representative there. I move you that the President be empowered to appoint all such delegates during times when this Society is not in session. Carried.

Adjourned *sine die*.

## RESOLUTIONS.

WHEREAS, The interest manifested at the summer meeting is so gratifying in its results: Be it

*Resolved*, That it be the sense of this Society to continue the same from year to year; and be it further

*Resolved*, That we tender a vote of thanks to the citizens of Hastings for their uniform courteous treatment of our members; to the proprietors of the Hotel Bostwick for the fine parlors in which our sessions and exhibition have been held, and the many kind attentions shown us; to the railroads for reduced rates; to the local representatives of Nebraska's press for their efforts to give our work proper publicity; and last but not least, to the enterprising members who have contributed so largely to the attractive exhibition of fruits, flowers, and plants, and especially to W. J. Hesser for his enterprise in bringing so large a collection of rare and valuable plants.

D. U. REED,

H. E. HEATH,

C. Q. DE FRANCE,

*Committee.*

Hotel Bostwick, Hastings, August 5, 1891.

## REPORT OF COMMITTEE ON FINAL RESOLUTIONS.

*Resolved*, By the officers and members of the State Horticultural Society, that we extend to the railroads and newspapers our thanks for courtesies extended; also to the Lindell Hotel for our accommodation as their guests; and to the chancellor and professors of the University for their hearty welcome to the University during the meeting.

C. H. BARNARD.

P. A. MURPHY.

G. A. MARSHALL.

## RESOLUTION BY C. H. BARNARD.

*Resolved*, That the incoming Treasurer take his office at the time of election and the incoming President appoint the standing committee and that the by-laws be so amended as to incorporate the same.

(Adopted at winter meeting, 1892.)

## RESOLUTION OFFERED BY C. E. BESSEY.

WHEREAS, We have learned that the United States forestry commissioner, Prof. B. E. Fernow, has suggested the black locust as the state tree to be used in the construction of the lumber and forestry building in the World's Columbian Exhibition at Chicago; and

WHEREAS, the black locust is not a native of this state nor is it considered by us as one of our characteristic forest trees: Therefore

*Resolved*, That we request the commissioner to erase the black locust from his published list of state trees and to substitute the burr oak as the tree by which Nebraska is to be represented; this tree being one of wide distribution in the state and most abundant in all the older portions, extending fully one-half way across the state from east to west.

(Adopted at winter meeting, 1892.)



## GROWING, TRANSPLANTING, AND CARE OF EVER-GREENS IN SOUTHEAST NEBRASKA.

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BY W. R. HARRIS.

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When seedling evergreens, which are trees from one to two years old, are received from the seed bed, we heel them in a shady place, where they are left for eight or ten days. Those that will grow will by that time put out fibrous roots. Now prepare your bed by spading the ground twelve to fifteen inches deep and thoroughly pulverize. Make the bed four feet wide, and as long as you need, having the long part north and south. Open a ditch across the bed, and plant two inches apart in the row, and the rows six inches apart. Press the dirt tightly around the roots when through planting, and put loose dirt over the bed to keep from baking. Next drive stakes on each side of the bed, about eight feet apart, and nail a six inch board about two inches from the ground, and another about three feet at the top. Tack strips across the tops two feet apart, and cover with a thin covering of slough grass, to form a partial shade for the young trees. (Of course strips must be fastened over the grass to hold it to its place.) Keep all weeds pulled out, stir the ground occasionally, and water as often as necessary.

The second year remove the cover, keep the ground clear of weeds and do not allow the ground to bake. The third year plant out in nursery, in rows four feet apart, and twelve to fifteen inches apart in the row. Cultivate thoroughly until August 1st. Every other tree should be taken out the second or third year from planting if not sold. The trees should be root-pruned every other year until sold. We have had best success transplanting large evergreens in April; good success in May, and fair success in June.

Large evergreens should be pruned back from one-third to one-half when transplanted. Dig the hole large enough so that the roots lay out straight from the trees, and the outside of the hole deeper than the center, so the roots will be inclined downward. If the ground is very dry put in two or three buckets of water for a large tree, letting it

soak away before planting the tree. The roots should never be exposed to the sun or wind, even for a moment. If proper care is taken the losses should not be any more than with fruit trees. The best varieties of pines to plant so far have been the Scotch, Austrian, and Red cedar. The Austrian pine has been affected with bacteria or blight for the last two years, which causes the foliage to turn brown in autumn and fall off the next spring. I shall not plant any more of them at present.

The white pine, white spruce, and Norway spruce are doing very well. The white pine after ten years will make the best growth of any of them. When the Scotch and Austrian pine are on the decline, the white pine is in its glory; for a large stately tree, it is ahead of all of them.

The Colorado Menzies, or blue spruce, is doing well, but grows slow at first. The hemlock, Douglassi, and Concolor are doing well on my grounds. The Siberian arbor vitæ and dwarf mountain pines are the best dwarf evergreens we have.

I will give the measurement of a few trees planted in my lawn in 1885-6, and which have had no cultivation.

Hemlock spruce, 17 inches when put out; now 6 feet high and  $6\frac{1}{2}$  inches in circumference.

Scotch pine, 8 feet high when put out; now 16 feet high and 22 inches in circumference.

Austrian pine,  $2\frac{1}{2}$  feet high when put out; now 11 feet high and 22 inches in circumference.

Red cedar, 2 feet high when put out; now 10 feet high and 9 inches in circumference.

Siberian arbor vitæ, 8 inches high when put out; now 4 feet high and 8 inches in circumference.

Norway spruce, 3 feet high when put out; now 8 feet high and 13 inches in circumference.

White spruce, 20 inches high when put out; now 10 feet high and  $17\frac{1}{2}$  inches in circumference.

Concolor, 1 foot high when put out, 6 years' growth; now  $5\frac{1}{2}$  feet high and 8 inches in circumference.

Menzies spruce, 1 foot high when put out, 6 years' growth; now 4 feet high and  $5\frac{1}{2}$  inches in circumference.

Douglassi spruce, 1 foot high when put out, 6 years' growth; now 5 feet high and 7 inches in circumference.

Larch, when put out 4 feet high, 7 years' growth; now 20 feet high and 19½ inches in circumference.

The Black Hills spruce and silver cedar are growing nicely. There are some specimen trees here 7 to 10 feet high.

If the farmers and fruit growers would plant more evergreens for wind breaks around their orchards and feed lots it would be a valuable investment to them in a few years. Scotch pine, red cedar, white spruce, and white pine would be the best trees for wind-breaks, and if we can get the people of Nebraska interested in planting more evergreens we will have made a long stride in the right direction.

## ORNAMENTAL TREES AND SHRUBS FOR NEBRASKA.

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BY PETER YOUNGERS, JR.

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The subject of ornamental trees and shrubs is one of much interest to us all, and the question arises what shall we plant to obtain the best results? The location, size of lawns, and surroundings, have a great deal to do with our success, and while a tree or shrub will thrive in one portion of Nebraska, it may be an utter failure in another portion. I think it would be a good thing for the future planters if we were to make a list of what might be termed "Iron-clad ornamental trees and shrubs," of such varieties that would be apt to succeed in all portions of our state, or if we were to classify them as we have our fruit list, with recommendations that they are suited for the various districts of our state, and by a yearly revision of the list we could soon furnish to the planters a list that would assist them to beautify their homes, no matter what portion of the state they may reside in. Among our ornamental trees that succeed well in all portions of Nebraska is the white ash. While one of the common trees native to our state, none is hardier or surer to grow; its beautiful glossy leaves making it very desirable. Mountain ash, both common and oak leaved, will be found very useful for lawn planting, the beautiful clusters of fragrant flowers, followed by the bunches of red berries, making a truly ornamental tree. The European ash, if hardy in all portions of our state, would be an addition that is worthy of attention. I saw the tree in the extreme southeastern portion of the state. It is a very rapid, upright grower, and ought to be tested throughout the state. The English alder I have seen as far west as Oxford, Nebraska. There it seems as thrifty as if at home, but the trees are well watered and cared for. They have made a good growth in the nursery the past season. The American and European white birch ought to be on every lawn, as the white trunk and limbs form a strong contrast to the delicate foliage. It is very easy to transplant, perfectly hardy, and the European birch holds the leaves until winter.

## NEBRASKA STATE HORTICULTURAL SOCIETY.

The sweet and horse chestnut are both desirable for ornamental work. The sweet chestnut has fine glossly leaves and is not a very fast grower, hence would be desirable for small lawns. Horse chestnut has a very fine foliage and showy spikes of flowers, and is one of the earliest to put on its summer garb. *Catalpa speciosa* is also a valuable tree, as its tropical looking leaf and fine clusters of flowers attract attention when grouped with trees of smaller leaves.

The Teas hybrid catalpa seems full as hardy as the *speciosa* and is a more profuse bloomer. The wild black cherry can be used to good advantage, as it makes a very nice tree. We have a fine variety of elm to assist in the ornamental work, and our American white elm is in my estimation the grandest of all elms; still the English and Scotch elms are very nice for small lawns, as they are slower in growth and more upright growers than the American. The purple-leaved elm, or rather it should be called bronze-leaved, is a rapid grower and symmetrical: the ends of the leaves have a peculiar color more like bronze than anything I can think of when they first appear. The hackberry is another native tree that is worthy of a place but is not often seen in lawn or park. The American linden is a beautiful tree and succeeds over a good portion of our state; it is one of our native trees and should be more freely planted. The European linden is a handsome tree having bright red twigs and a very delicate leaf; it succeeds well in southeastern Nebraska, but I have not seen it growing in other portions, but think it worthy of a trial in any locality.

Of the maple we have the Norway, a very nice tree, a fine grower; the tree resembles the sugar maple very closely, but succeeds much better. I have seen this tree in nearly all portions of the state that I have visited and it seems to thrive well in all localities. The hard or sugar maple, while one of the finest lawn trees in America, does not thrive well after transplanting until it is well established, and it takes several years to recover, and if once fully established makes a very satisfactory growth. The soft maple is well known and gives a dense shade, is easy to transplant, is a rapid grower and gives us many beautiful autumn leaves.

There is a tree that has been classified by some as a shrub that should be on every lawn—the Russian olive; it is one of the trees that transplant easily, is a rapid grower, has very beautiful silvery leaves and a small yellow flower that is very fragrant; this

tree will please, as it is very hardy and succeeds in every portion of the state that it has been planted in.

The tulip poplar succeeds in some portions of our state and is very desirable where it can be used. The silver-leaved poplar will succeed in nearly or all portions of our state and has some nice points in its favor, but the objection to it is that it will sprout from its roots and that is a serious one to a nice lawn. The Boleana poplar resembles the silver poplar in leaf and the Lombardy poplar in growth, it is very showy, is a rapid grower and hardy.

The sycamore, another native, while like the soft maple and elm, might be classed more as a forest tree, still the nice handsome broad leaf, smooth upright growth, make it worthy of a place among the ornamentals and deserves to be freely planted.

Of the weeping trees that succeed we have the weeping mountain ash, and mulberry and several varieties of weeping willows; for beauty and hardiness we consider the mulberry the best in the list.

Among the evergreens we have the various varieties of arbor vitæ, the American, Siberian, golden, and others; while very handsome we regret they cannot at present be successfully grown in but small portions of our state. The hemlock will succeed where the arbor vitæ thrives, but for general planting would advise planting for trial only. Red cedar is one of the best evergreens as it is a native and thrives all over the state and can be sheared in any desirable form. The silver cedar from the Rocky mountains is a very handsome and desirable tree; when growing it has a bright silvery appearance and retains a good portion of the silvery appearance throughout the winter; it is very easy to transplant and is hardy. The Scotch, Austrian, and white pine succeed in a large portion of our state and vary in foliage from a light to a dark green, the Austrian being the darkest and the Scotch the lightest colored. The spruce is one of the handsome evergreens that for a long time seemed we could not grow except in favored localities. While the Norway spruce will thrive only in a small portion of our state, we have in the Black Hills spruce, the Douglass spruce, and the blue spruce of the Rocky mountains varieties that will succeed I believe in any part of the state where the pines will succeed. The Engelmann spruce is very handsome, transplants readily, has a beautiful silvery foliage and is very hardy. *Abies concolor* is in my estimation the most handsome evergreen that grows, the beau-

tiful pale green color, the symmetrical growth, the clear bark making it at once striking and beautiful. With such a list to select from it seems as if any taste might be gratified. The evergreen furnishes a fine opportunity to blend colors, as they vary from the silver colored spruce to the almost black pine.

*Shrubs.*—In the shrubs we have the altheas of various colored flowers and leaves, but in most localities they need winter protection; they will well repay any extra care by profuse blooming. The Russian acacia is a very hardy shrub; its chief beauty is in early spring when it commences to grow. The shrub looks as if silvered; it has a small yellow blossom and thrives in any locality. The flowering almonds, both red and white, are desirable on account of being among the first to bloom. The purple berberry is useful in groups, as the purple leaves form a strong contrast among other shrubs.

The Deutzias, while very desirable, need winter protection. The Tartarian honeysuckle is iron-clad and a very fine bush with a profusion of blossoms and transplants very readily. Hydrangeas should be on every lawn as this beautiful flower blooms so late, from August until November, at a time when a lawn is pretty well stripped of flowers; its large handsome showy spike often attaining twelve inches in length and four inches in diameter, of beautiful white flowers, should make it a favorite as it is hardy and transplants readily. Of lilac and Persian, white and purple, planted in groups make a very pretty sight when in bloom. The moss acacia or moss locust, is a very free bloomer, it is very hardy and blooms the first season. We have transplanted shrubs eight inches high and had quite a nice lot of flowers the first season. The purple and white fringe succeeds in some portions of our state and should be used more freely where they succeed, as the delicate fringe-like bloom resembling smoke is odd and striking. The Japan quince is also a very fine shrub. The Syringa is also worthy of a place on any plat of ground; it is very nice free blooming plant and thrives in a large portion of the state. In Spireas we have a nice assortment of hardy and free blooming shrubs that will give good results in fine blossoms if well cared for.

The strawberry tree, or Wahoo, is a small tree that would properly come under the head of shrubs. It has a very nice light green foliage and fine clusters of scarlet berries that resemble the bittersweet berries, that remain on the tree all winter. The snowball, one of our old

sorts deserves a place in the front rank of ornamental shrubs; a good bloomer and nice leaves and is perfectly hardy. The *tamarix amurinsis*, a Russian variety, attaining a height of fifteen feet, has a very fine feathery foliage of light green, the delicate pink flowers, the slender drooping stems, almost resembling a weeping tree; its hardiness and ease of transplanting should make a place for it on every lawn. African *tamarix* resembles the *amurinsis*, but is not as hardy. The *wigelia* is a very handsome shrub and thrives well, but needs good protection.

While I have endeavored to give an outline of the varieties that I am familiar with, we know this list is very incomplete, and if we adopt a standard for ornamental trees and shrubs we will no doubt bring many favorites out that have been overlooked.





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MISCELLANEOUS.

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MATTER SELECTED FROM VARIOUS SOURCES ON ACCOUNT OF ITS  
GOOD QUALITIES.

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## THE GRAPE SCARE.

George T. Powell, director of the New York Farmers' Institute, in speaking of the hasty action by the Board of Health of New York City on grapes whose vines had been sprayed with the Bordeaux mixture, said: The alarm caused to consumers, and the loss that followed to producers, of this most desirable fruit has been inexcusable and without reason. When Paris green was first used upon potatoes to check the potato beetle in its destructive work the same kind of alarm was raised, that consumers would be poisoned by eating potatoes thus treated. Had not the practice of applying Paris green been persistently followed, the people would long since have had to dispense with this very important food. When Paris green was first applied to apple trees to destroy the codling moth the alarm of poisoned apples was again raised. The vineyards of this country are threatened with annihilation by mildew, rot, and other fungus troubles. The spraying with Bordeaux mixture and other solutions has proved to be effective in checking these ravages, and no instance is on record of any injury having followed in the consumption of those fruits thus treated. I have personally inspected a large number of vineyards during the past season in this state and have found in instances where the spraying had not been done that the entire crop of grapes had been ruined by rot, the vineyard abandoned and weeds grown up as high as the trellises, while in the same locality those properly treated were carrying a full crop of fine fruit. The instruction given in the farmers' institutes in all fruit growing sections has been to spray vigorously with arsenical poisons for insect pests, and with the copper solution for fungus diseases, with marked results in the general improvement in the quality of much of the fruit going upon the market.

In the Bordeaux mixture lime is used, which causes the material to adhere like cement to the wood and stems, long after its effect has passed off. The Bordeaux mixture can be dispensed with, for the lime is troublesome, causing the nozzles to clog and work imperfectly, and

the material to color the fruit and stems when dry weather follows this application. Spraying should be done as a preventative, not as a cure, and hence should be done early in the season most vigorously, even before the buds open, then late spraying near the time of ripening and shipping the fruit will be unnecessary. For insects, one pound pure Paris green dissolved in 225 gallons of water will be ample; for grape rot, three ounces carbonate of copper and one pound carbonate of ammonia dissolved in two quarts of hot water, then diluted with fifty gallons of water, has proved as effective as the Bordeaux mixture, is more easily applied, and washes off readily with the first light rain. In spraying, these solutions do not need to be put on in large quantities. Pumps are required of great power to throw the material in a fine mist, which is better than a drenching quantity. Applied in this manner, young stock need not be taken out of orchards while spraying, and no discoloration will appear upon the grapes even if sprayed late in the season. The choice is to eat sprayed fruit, or dispense with it largely as food, which the people will not do, for it is no longer a luxury but a necessity, and if the instructions given by the Department of Agriculture, by the farmers' institutes, and our experiment stations are carried out, the consumers of fruit and boards of health will have no cause for alarm.

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### GRAPES A SPECIALTY.

The grape crop furnishes a greater amount of light, pleasant employment than any other occupation on the farm. Much of the labor in dressing the vine and gathering the fruit can be done by women and young people unable to do heavy work. Vines begin to bear the second year after setting, and in five years will yield an average of twelve pounds per vine. Allowing 500 vines per acre, this gives 6,000 pounds or three tons of grapes. Large companies are organized to grow grapes by the hundred acres and exclusively by hired help. If it pays thus it will pay still better for the farmer who sets apart one, two, or three acres and cultivates them with the help of his family and of employes hired by the month or year, and therefore costing less than help hired for a short season by the day. Much of the success of this experiment depends on securing varieties adapted to the

locality and early enough to ripen in any season. The earlier the grape is, provided it is of good quality, the better price it commands. Some of the growers sell much of their fruit at eight to ten cents per pound. Later in the season the price runs down as low as two and three cents at wholesale. If ripe fruit goes below three cents, the demand for grapes for wine prevents further depreciation in some sections. Even at the low price of three cents a pound three tons of grapes per acre yield \$180, which is more money and more easily made than can be got from ordinary farm crops. It is not strange that wherever grapes are found to succeed, farmers are anxious to devote part of their land, capital, and labor to cultivating this fruit.

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### THE GREEN MOUNTAIN GRAPE.

In our September 15th issue we gave a description of the Green Mountain grape as it appeared to us from a sample bunch kindly sent us by Stephen Hoyt's Sons, of New Canaan, Conn. This sample seemed to us to deserve unstinted praise. We are now pleased to supplement our own opinion by that of the editor of *The American Garden*, who has fruited the Green Mountain grape on his own grounds at La Salle, New York. The notes made in this case are on the comparative merits of the Green Mountain, as it grew along with perhaps fifty other varieties: "Green Mountain, or Winchell, came out nobly. It surely belongs at the head of the list of first earlies, and compares favorably with later ones also. Sorts like this ought to crowd the Champion, and the unripe Ives, and other abominations out of our markets. Berry not above medium size, but bunch large and remarkably handsome. It ripens but little later than Champion, and keeps well for a long time, especially if bagged. Its quality is quite superior, sweet, pure, and luscious. Besides all these points of merit, it also has strong canes and heavy foliage, and yields a fairly heavy crop. This variety will surely make its way into public favor. Whatever name will prevail for it in the end, the unpatented 'Winchell,' or the patented 'Green Mountain,' it is by far too valuable to be much longer ignored by the American Pomological Society. The latter, in refusing to recognize it officially, will simply remain in the rear of enlightened sentiment."

### A NEW RASPBERRY—THE OLDER.

This originated in northeastern Iowa about ten years ago. I have now grown it four years. Last season I kept an account of all my raspberries as I picked them, and the Older produced fifty per cent more fruit than any of them, on the same amount of ground. The Older is jet black, no bloom, about as large as the Gregg, three days later than Tyler or Souhegan in time of ripening, and about six days earlier than the Gregg. It is decidedly the richest and best berry, when canned, I ever tested. Mr. S. T. Ballard, of Wisconsin, says of the Older's good qualities in *Kansas Review* :

"First—Its hardiness to withstand all winters as far north as the Wisconsin line, where I am growing it, and perhaps as far north as Lake Superior.

"Second—It is perfectly drouth proof, always ripening all its fruit into fine berries when Gregg, Ohio, Tyler, Souhegan, and Millborn will dry up and not half be fit to pick.

"Third—It will produce more fruit to a yard of row than any other berry. It ripens six days in advance of the Gregg.

"Fourth—The berries average larger than any other the season through. They are coal black, with the thickest and richest of juice and the smallest seeds of any black cap; hence, is best for table use and canning."

So far as my judgment goes, after growing it for four years, I think Mr. Ballard's estimate is correct.—R. D. MCGEEHON.

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### PROGRESSIVE HORTICULTURE.

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A paper read by Silas Wilson before the Farmers' Institute of Cass County, Iowa, 1891.

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Horticulture is a subject I love. Twenty-three years of my life have been spent in the study and pursuit of horticulture. I came to this part of the country with pretty near the first advance of civilization; before orchards and gardens had found a place here, and when

on account of the severity of the winters, it was very generally believed that fruit culture could never be successfully pursued in this county, which is now the home of twenty thousand people, who rank in intelligence, enterprise, and prosperity equal with a like number on any part of the globe. I came from a land where fruits were abundant and easily grown, and brought with me a great relish for fruits and almost an adoration of flowers and beautiful surroundings. Twenty-three years have since passed over the scene and a most wonderful transformation has taken place. During those years I have improved every opportunity to encourage the beautifying of your homes by the planting of flowers, fruits, shrubbery, and trees about them, and the adornment of city and country. Now and in the future, here and elsewhere, I am the advocate of horticulture. Horticulture is defined as the most perfect method of tilling the earth so as to produce the best results, whether the products are objects of utility or of beauty. Literally it means gardening—gardening for pleasure and gardening for profit, gardening of every kind and in every place, caring for the cheap plants in the window of the poor laboring man's cottage, and in the rare and costly conservatories, bay windows, and beautifully laid out grounds of the great and wealthy; growing simple vegetables upon the cramped town lot for the home supply, or upon broad acres for the market; the little patch of the most common fruit, or great commercial orchards; planting shrubbery upon the lawn, shade trees along the highways, and forests in waste places and upon the prairies of the great west, for the benefit of future generations—these are all gardening; so, too, is the keeping up of beautiful parks and shady drives, and the adornment of the grounds of schools, churches, hospitals, prisons, and cemeteries, and, I will say more, the cultivation of those home plants—your children—in virtue, morality, and temperance. To teach, assist, and encourage all who are engaged in any of these pursuits is the mission of horticulture. Horticulture is a gracious art, which through all time has been a symbol of peace and art, joined in the closest ties with nature, and her helper in the daily miracle by which she clothes the earth in beautiful garments, and then comes the application of her art; it is to sow and plant, to prune and train, to transplant and propagate by budding, layering—by cuttings and grafting. There is no other occupation of man that is so ample in its range or so multiplied in its allurements, or that is calculated to



affect us with more wholesome influence or fill us with purer sentiments or holier aspirations.

The history of horticulture or gardening can be divided into three sections, viz.: The ages of antiquity—commencing with the earliest accounts and terminating with the formation of the Roman empire; the ancient ages—from the rise of the Roman empire to its fall; and modern times—from the close of the second period to the present day. In the first of these periods we have the Garden of Eden, Noah's vineyard, and the other gardens mentioned in Scripture and tradition. In our country a high grade of horticulture is but in its infancy, but most wonderful advances have been made within the last twenty years, even far beyond those of wealth and population, and the present indications are that the time is near at hand when the gardens of America shall surpass those of all other countries. It has enlisted ability, skillful energy, and knowledge to push the work, and meeting here, as it will, the approbation of all classes of people, it is bound to lead men to distinction as surely as any other profession. Of what greater names can our nation boast to-day than those of Wilder, Downing, and scores of kindred spirits that are household words in every American home? Horticulture, if broadly pursued, is in itself an educating power, and no other pursuit can surpass it for training the powers of observation. The mind of the true horticulturist is always on the alert to detect the working of the principles that govern nature's laws and carry them to their practical application. The world to-day is indebted to horticulture more than to any one art for its civilization, refinement, virtue, morality, and true Christianity; and, as the years roll on and the population increases, it will continue to gain importance.

Horticultural societies are a means of usefulness that should be encouraged and liberally sustained, and they are yet, in my opinion, destined to exercise an influence for good hardly surpassed by any other society. Horticulture, sustained by the citizens of your cities and towns, and by the farmers and the gardeners in the adjacent country, will accomplish a vast deal of good. If sustained, it is bound to kindle horticultural tastes, and diffuse a love for the cultivation of flowers, and fruits, and vegetables that shall exercise an elevating influence upon all your people, and will also supply your tables with most wholesome and appetizing food. It will incite emulation in

and around your homes; it will create for you parks and pleasure grounds, where the weary sons and daughters of toil may occasionally resort to get away from the monotonous hum of machinery and the turmoil of business, and breathe God's pure air and commune with nature. As horticultural tastes are improved, and more and better fruits are placed within the reach of the masses, many of the temptations that allure youths to haunts of vice and intemperance will be disarmed or removed. It will continue to add new beauties to your city, and, as they unfold their benign influence, will reach out far into the country on every side. Finally, what I say to the citizens of Cass county will apply equally to every citizen in western Iowa. And now let us ever remember the mission of progressive horticulture is not narrow and personal, but generous and broad, and that rewards shall come in a consciousness of having bettered the condition of our race; and let the watchword ever be, onward until city and country shall be transformed into a modern Eden.

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### SPRAYING.

Nothing will more clearly distinguish between a business man and a shiftless fruit grower in the future than the matter of spraying fruit trees to protect against insect and fungus depredations on the fruit crop. The shiftless man will probably find his fruit more damaged each season, and what little of it matures will be harder to sell. In this connection it may serve a useful purpose to call attention to how quickly buyers get educated up to a new thing. In the past a large part of the apples offered in market were expected to be infested with the codling moth. There was no preventative known and such fruit was not rejected. Already shipments of fruit reach market in perfect condition. Buyers know that the codling moth can be destroyed. They insist already that fruit must be free from worms.

How perfectly the fruit may be protected from the moth by spraying is told in the *New York Tribune* by Waldo F. Brown, who, with his usual keenness for actual results, has put spraying to a comparative test. He says: "Recently I saw two trays of apples, each containing 100. The fruit in one tray was taken from a tree which had been sprayed, and in the other from an unsprayed tree adjoining, the apples

in both cases being taken as they grew, without assorting. The apple in each tray were divided into three grades—first, second and third, No. 1 being entirely free from wormholes and knots, No. 2 having one or two blemishes, and No. 3 being so small and knotty as to be worthless. In the tray occupied by apples from the unsprayed tree, there were four first-class apples, fifty-eight second class, and thirty-eight culls. In the tray containing fruit from the sprayed tree, there were eighty-four perfect apples, nine second-class, and seven culls.

“The ratio of eighty-four to four in favor of spraying don’t leave the shiftless fruit grower perfect specimens enough to set a defense upon. The brass nozzle and the Paris green barrel have come into the orchard to stay. They are as essential there as in the potato field. There is no hope for the fruit grower who won’t keep up with the procession in the war on insect enemies.”

#### NOTES.

There is a wonderful awakening of interest in orcharding for profit in Nebraska. Inquiry as to the best sorts, methods of planting, and all the questions involved are being asked and answered in every paper. As a matter of fact more money has been made during the past two or three years from well tended orchards than from any other product of the soil. Nebraska, especially the southeastern portion, is found to be one of the best orcharding sections in America.

**WINTER CARE OF THE VINEYARD.**—Each autumn the truth should be again impressed upon the owner of grape vines that they should be properly cared for. Just at this time if pruning has not been attended to it should be done. Leave on only enough wood to carry sufficient fruit for a full crop next year. One is much more likely to leave too much than too little. Then take the vines down from the supports and cover in some way. Coarse litter may be used, or earth. Incidentally something may be said upon the care of the wood removed, in case it is proposed to use it for planting. Cut into lengths of a foot, tie up in bunches of one or two hundred, and bury in earth, taking out for planting in the spring.

**MURDER THEM.**—That is the rabbits. In a less time than one would imagine they will do a vast amount of damage. When food becomes scarce they will all at once attack the fruit trees, and girdle them, or gnaw the bark so as to leave a permanent scar. The place

for the permanent wound is on the rabbit, not on the tree. Steel traps are good, in fact one of the best safe-guards against rabbits, or poison may be given in corn thoroughly soaked in water in which arsenic has been dissolved. Put an ounce of arsenic into a pint of hot water, keeping away from the fumes. After this is cold, pour it over a pint of shelled corn. Scatter the corn in the runs of the rabbits, they will do the rest. Of course you will see to it that the corn is not scattered where other animals will get it.

**ABOUT THE CARE OF APPLES.**—Many are now laying in their regular winter supply of apples, and a word as to how to keep them may be in order. In the first place, keep them cool. The nearer freezing temperature they are the better. As a matter of fact they will stand some degrees of frost but it is not safe to rely upon this. Then thorough ventilation should be given, that the air always should be fresh. The same remarks will apply to the keeping of other fruit, such as the grape. Some of the late sorts, like the Catawba, may be kept easily, till the holidays, if they be enclosed in paper bags, each bunch separate, and otherwise treated as above.—F. W. TAYLOR.

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### THE FRUIT CROP OF 1892.

What if the present and past two years of abundance were to be followed with a total failure? What the winters will be is an uncertainty. Heavy and continuous bearing for three years has lowered the vitality of trees and plants, and there is a probability that if they do not rest and are not entirely fruitless, they will crop light. Long and continuous wet weather during the growing period has caused excessive wood growth, and this is generally followed by imperfect fruit-bud formation. The late dry fall that saved the corn crop has in a large measure ripened up the new growth, but this cannot help out the fruit-bud formation very much.

Fruit has been plenty and cheap. The low price has made people careless and caused them to drift into the idea that the conditions that have lately prevailed will continue, and that no thought or anxiety is necessary for next year's crop. Glutted markets and low prices add to this indifference. At this season it is well to remember that a high price during an off year is where the fruit business tells, and it is not

too late to work for it even yet. A large share of the success of a crop of fruit lies in the cultivation of the trees and plants the season before. This time is past, but severity of the winter can yet be mitigated by mulching strawberry beds, pulling raspberry and blackberry canes, and thinning grape vines over and covering them with mulch or earth. If bearing apple trees are heavily manured in early winter with ordinary stable manure they will winter better and the fertilizer will be of great advantage next season. Good cultivation and proper management the past summer would have been a long step to a good crop next year, but the many things of which the above is but an illustration, if done before the freezing of the ground, will be another factor to determine success next season.

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### THE MODEL ORCHARD.

S. M. Cramer, in a paper before the Franklin county (Kansas) Agricultural Society, said: Had I ever seen what to-day people call a model orchard, then I could have a foundation on which to back my subject, but I fail to find a model orchard; therefore this in part is only theory. First is the locality, which should be high and dry, a deep, rich soil underlaid with a rich, porous subsoil that will afford ample drainage, sloping east, north, and northeast, as this slope is best protected from the hot sun which badly affects the orchard on south slopes in the latter part of the pruning season. The trees should be carefully selected from home grown stock and transferred to the orchard in the fall if possible. I consider fall setting best. Set them thirty or thirty-five feet every way in the rows to give room and free circulation of air. All upright growers can be profitably grown twenty-five feet apart in rows. Now, to give my idea of this model orchard, I will take into consideration a small commercial orchard of 1,500 trees. Placing them thirty feet apart every way will occupy about twenty-eight acres of ground, which must be in good cultivation before setting the trees, giving the names of the standard and most profitable varieties grown in this country: 50 Winesaps, 100 Powhatans, 50 Huntsman's Favorite, 50 Missouri Pippins, 100 Rome Beauty, 100 Smith's Cider, 50 Bailey Sweet, 100 Ben Davis. These varieties command the highest market price and are always in demand.

Root pruning and the cutting away of all broken and bruised roots should be done before planting any kind of trees. The trees should be set a little deeper than they stood in the nursery. If the ground is dry, tamp the roots firmly; if not, tamp lightly. Grow four limbs on your trees the first year and no more, placing them on opposite sides and as far apart as possible, with the lowest limb to the southwest to protect the trunk of the tree from the sun. Keep the main center of your trees growing straight up; if side limbs are likely to outgrow the main center, pinch out the terminal bud, which will check its growth, allowing the main center a better flow of sap. The same process must be strictly observed the second, third, and fourth years, allowing only three or four limbs to grow each year, keeping them as far apart as possible and on opposite sides of the tree; two limbs together, but on opposite sides of the tree, is not objectionable, but had better be at least ten inches above, so that the base of the limbs may not crowd each other in old age. In this one particular all our fruit growers have made their great mistake—too many limbs and too close together. What we want is a main center to every tree, and all limbs far enough apart that they will not come in contact with each other at their base. If the terminal bud of the young tree dies, cut back to a bud that will grow, by setting your knife on the opposite side of the tree and a little below the base of the bud; cut off then just above the bud, but close to it, that will give the bud a chance to grow straight up the first season and give the tree a main center, which it must have to make it a durable, profitable tree. Fewer limbs and more body to our trees will add greatly to the life of the orchard and much to the quality of the fruit and to its value. Our losses on orchards begin in many cases in the purchase of trees—first, a poor quality of trees; second, untrue to name; third, poor transplanting; fourth, negligence and want of attention for the first four years after transplanting. The round head borer has proved more disastrous to neglected young orchards than all other causes combined, but our main and great loss now is the falling to pieces of the old orchards that are splitting down, caused by an overgrowth of large limbs so close together that they press each other loose from the center, admitting water, which soon takes decay and the limbs drop out.

Many farmers lose their fruit after it has matured for want of time to put it on the market at the proper time. Serious losses occur by

the codling moth, the tree cricket, the tree plant louse or the woolly aphis, late spring frosts, high winds, hail storms; also by members of the animal kingdom who keep late hours at night. Our profits, where do they come in, to equal all those great losses? I can see only one way and only one chance for our escape from these losses on the orchard culture, and that is by raising fine fruit and plenty of it, which can be done only through everlasting vigilance, undaunted courage, and the right kind of industry backed by an iron muscle. Our profit on fruit is only on a very few varieties, as the most of them are really not profitable for general use, especially among the light colored varieties. Our greatest profits are on winter varieties, the most of which are highly colored apples, for which there is the greatest demand. Our profits on vinegar, apple butter, jellies, and cider are so light that we can hardly afford to invest our time with them, as the markets are always over-stocked with shoddy grades of that kind which are manufactured from drugs and acid. But few fruit growers are prepared to manufacture these classes of goods to perfection and make it a profitable business at any price, therefore a portion of the profit of the orchard is lost which might otherwise be saved.

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### ORCHARD PROTECTION.

The statement made recently in *Orange Judd Farmer*, that a thin coating of axle grease applied to the trunks of young orchard trees would protect them from mice, rabbits, etc., has brought out considerable discussion of this subject from leading orchardists, nurserymen, etc. Below are a few more methods and opinions we have received on the subject.

A. H. Gaston, Lacon, Ill., writes: I have been using axle grease on orchard trees as suggested by H. M. Dunlap, Savoy, Ill., for the past two years, and have found it a perfect success. Use but a small quantity on each tree. If rubbed on one side of a tree it seems to turn the rabbits away. I take a box of new axle grease and a half-worn shoe brush and paint the trunks about the 15th of December. If the winter has been rainy, repeat the operation about the first of February, or a first application can be made now. A lath and wire fence put around an orchard or nursery will keep rabbits and chickens out at very trifling expense, if rightly put up.

J. C., Mt. Carroll, Ill., writes: My plan to prevent rabbits from barking trees is to cut cornstalks about three feet long and tie from four to seven of these around the trees.

W. H. A., St. Louis, Mo., says: I have been using axle grease for six years on my fruit farm and have planted out during that time over 6,000 fruit trees. Having thus given it a thorough trial, I can say I would use nothing else. It is cheap, easily applied with an old woolen rag and is effective. I use "*Frazer's*."

C. S. Chantilly, Kan., writes: I have used axle grease on orchard trees frequently and have seen no injurious effects. The only objection I have to it is, that it does not last long enough. I have painted my trees for the past three years with white lead paint and have seen no injurious effect. It is a perfect rabbit preventive, and lasts a year on small trees, and two or three years on those over an inch thick.—[We would suppose lead paints to be too close and fine a covering, acting like a tin sheathing in excluding air and preventing evaporation. Perhaps it may not be objectionable.—ED.]

The following is the method used by D. D. K., Primrose, Iowa: I take the butts of cornstalks, cut them about twenty-four inches long and free them of loose barky stuff and split them. I set these closely together around the trunk of the trees, split sides against the trunks, and push them into the ground as far as I can, as mice are the worst about the surface of the ground and below it. Press the stalks closely around the tree, so as to leave no cracks; tie them with binding twine. Two tiers are sufficient.

E. H., Canton, Ind., sends the following, which he recommends as well tried and effective: Mix together with water, 32 parts clay or clay loam, 16 parts cow dung, 1 part soot, and 1 part sulphur. Apply with a brush. The proportions of soot and sulphur may be varied.

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## TREE PROTECTION.

Edson Gaylord writes *Orange Judd Farmer*: I want to add my item of experience about protecting young fruit trees from rabbits, mice, borers, etc. Several years ago I wrapped the trunks with black tarred paper and thought I had found an excellent remedy for these pests, but after the paper had been on two winters and nearly two



summers, I found the leaves beginning to turn brown and the trees looking unhealthy. Examination showed that the bark where the tarred paper touched it had turned black and dead. On those where the paper had been closed up tight, the trunks were much larger under the paper than above it. All the trees were seriously injured. Though this same result has been observed by growers many times, the tarred paper is still advocated. The most simple and practical device to protect trees from rabbits, mice, and borers I have seen is one invented by A. J. Phillips, of West Salem, Wis. It consists of six or seven laths woven together with fine wire. These are set about the tree and held in place by twisting the ends of the wire together. The laths should be long enough to reach from the ground to the branches, and when properly constructed will last six or eight years, or until the trees need no further protection. Rabbits are cautious, fastidious creatures, and if the trunks of the trees are smeared with any substance offensive to them they will not touch them. A wash made of lime, clay, and a little sulphur, or snuff, is good. Rubbing the trunks with liver, or any bloody meat, will also keep them away, but the best plan is to trap the rabbits. If a tree is barked by rabbits or other cause, it can be saved by banking it up as soon as possible with fresh earth. I open an old length of stove-pipe, put it around the stem and fill it with fresh earth, and have saved many trees in this way. My experience with grease as a protection from rabbits is not satisfactory. It has killed the trees every time. If care is taken to protect the trunks as indicated, and the tops of trees are grown *toward* the sun until maturity is reached, to prevent sun-scald, but little difficulty will be experienced in orcharding.

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### BUCKWHEAT IN ORCHARDS.

Notwithstanding the fact that the summer has been cool and moist, many report that blight has been severe on the apple. We have received favorable reports of buckwheat as a preventive. A farmer having a young orchard near his house that had been given good culture and was in flourishing condition up to this spring, planted the end next to the house in garden truck for family use. The end farthest away he sowed in buckwheat. The same varieties extended in

both plats. The hardy sorts blighted some in the garden portion, and the bad blighters were considerably damaged, while in the buckwheat portion there was no blight on the hardy sorts and the varieties subject to blight were affected scarcely at all. This shows that the best of culture will not always prevent blight, and that during the time of its ravages there should be some soil covering to keep the ground cool. Buckwheat stands first as a crop for this purpose, and clover second. This has been determined by experiment by Captain Speer, the former director of the Agricultural Experiment Station at Ames. Any one can test the matter by the use of the thermometer in different growing field crops.

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## BIRDS BENEFICIAL TO HORTICULTURE.

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By Prof. D. E. Lantz, of the Kansas Agricultural College, and read before the Kansas State Horticultural Society.

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As to birds which are beneficial to horticulturists and their interests, it would be much easier to give a list of those which are injurious: I find the balance in nearly every case in favor of the birds. Every circumstance attending the matter should be considered before rendering a judgment. Some birds do damage to small fruits, but they far more than balance this by feeding largely upon the injurious insects which infest the same fruits. I append a list, naming many of them in groups only, putting the most useful groups first.

### BIRDS BENEFICIAL TO HORTICULTURAL INTERESTS.

1. Bluebird, feeds entirely upon insects, mostly injurious kinds.
2. The viroes, or greenlets (three species common), feed mostly on leaf-eating larvæ.
3. The fly-catchers (pewee, king-bird, etc., seven species), feed entirely on diurnal flies, moths, etc. The king-bird does no appreciable injury to bees.
4. The woodpeckers. Every member of this family is useful, and none do any damage which cannot be prevented without destroying the birds. These birds are not protected by our state law, a matter which should be remedied without delay.
5. The wood-warblers; especially the common yellow-bird.

6. The orioles (without exception).

7. The swallows (without exception).

8. The cedar-bird known as cherry-bird. Specimens of this bird captured show that except in the cherry season, its food consists almost exclusively of canker-worms, codling moths, and other injurious insects.

9. The house-wren.

10. The robin.

11. The cat-bird.

12. The brown thrush.

13. Most of the sparrows. (They feed on insects in summer and upon grass and weed seeds in winter.)

14. The night hawk, or goat sucker.

15. The cuckoo.

16. The chimney swift.

To this list, on account of the farmer in general, I would add quail, most hawks and owls, blackbirds, in fact the whole list of birds except the following:

1. The English sparrow.

2. The blue jay (not because of its injury to fruit so much as because of the persistent way he has of robbing the nests of more useful birds.)

3. The sharp-shinned hawk.

4. Cooper's hawk.

5. The crow. (This species is in doubt in my mind.)

6. The turtle-dove. (This bird does no harm, but as it also does not do any positive good, it is of doubtful utility. I do not think they should be destroyed. I have been told that they puncture the grapes when ripe, but this has never come under my own notice.)

This is a rough list hastily made. It includes only such as I think are directly useful to the horticulturist. I will say, further, that it does not require that the orchardist shall destroy birds that feed upon his fruit to keep them off. A few blank charges of powder shot into the midst of the marauders will be as effectual in keeping the birds away from cherries as all the destruction that can be dealt out with a shot gun. It is absolutely cruel to shoot birds at that season, as all the young in the nests starve to death when the parent birds are destroyed.

## POISONOUS APPLES.

The *Horticultural Times*, of London, England, renewed its attack upon American apples, charging more savagely than before that they are poisoned with arsenic. After reiterating its previous claims it says: "The three best sorts of apples as regards quality that are put upon the English markets are those raised at home, in Tasmania, and by American growers. Our own take the lead, and the others follow in the order assigned. Now, if we compare the three together, we find a delicate tint about the American fruit which is not to be found upon either of the others. Again, if an American apple, before it has been handled in the barrel as it comes first to hand from the vessel, is carefully rubbed with the finger, it will be seen that a fine delicate powder in most cases is removed. This is arsenic adhering to the skin, and if the fruit be eaten at all, it should certainly be wiped first with a cloth. We assert that the delicate, unnatural tint referred to is produced by arsenic which is absorbed through the skin. In connection with arsenic in American apples we might with justification refer to a mysterious case of poisoning which took place some years ago. A lady died suddenly and her husband was arrested on suspicion of having caused her death. In due time he was committed to the Durham assizes for trial. At the trial the analyst stated in his evidence that the apple pips found in her stomach contained arsenic and it was admitted that the deceased had eaten freely of apples immediately before her death. In consequence of this her husband was acquitted."

Every horticulturist of this country knows that no truth is contained in the above statements as made by the *Times*, for if it were true that American apples became poisoned from spraying mixtures, commonly used, then over a tenth of the entire populace of the United States would have long since been consigned to an unnatural death. To assert then that American apples are poisoned from arsenical spraying applications, thereby making them dangerous as human food, is simply a falsehood in the extreme. Were there a shadow of truth in the statement, the people of our country would ere this have suffered to death.

## FUNGI AND INSECTICIDES.

E. G. Lodeman, assistant in horticulture at the Cornell (N. Y.), Experiment Station, treats on combinations of fungicides and insecticides, and some new fungicides, in Bulletin 35, just out. He concludes by making the following summary:

*Carbonate of Copper.*—*a.* The action of ammoniacal carbonate of copper as a fungicide does not appear to be lessened by the addition of Paris green or London purple. *b.* The ammoniacal carbonate of copper gave better results as a fungicide when used at the rate of one and one-half ounce dissolved in one pint ammonia and diluted with twenty-two gallons water, than when three ounces of the carbonate and one quart of ammonia were used. *c.* The fungicidal action of a combination of the carbonate of copper held in suspension in water, and the arsenites, is not marked. *d.* Combinations of the ammoniacal carbonate of copper and Paris green or London purple, or, of the carbonate of copper suspended in water and these arsenites, have a caustic action upon foliage as a rule. *e.* Paris green renders the ammoniacal carbonate of copper more caustic than does an equal amount of London purple; but *f.* When London purple is applied in connection with carbonate of copper held in suspension in water, the combination is more caustic than one in which an equal amount of Paris green is used.

*Sulphate of Copper.*—*a.* The effect of the combinations of the sulphate of copper and Paris green and London purple upon fungi was unsatisfactory. *b.* The action of the commercial sulphate of copper upon foliage is uncertain. *c.* The injury done to foliage by the sulphate of copper was increased from 10 to 20 per cent by the addition of Paris green or London purple.

*Hydrate of Copper.*—*a.* When the hydrate of copper is applied alone it is not so effective against fungi as when applied in the Bordeaux mixture. *b.* Two applications of the hydrate reduced the injury from fungi at least 5 per cent when used at the rate of one-eighth pound in twenty-two gallons of water. *c.* The hydrate of copper when applied alone did little injury to the foliage, only the peach being af-

fectd. *d.* The caustic properties of the hydrate is increased by the addition of Paris green. The peach was injured 35 per cent by such a combination.

*Borate of Copper.*—*a.* The borate of copper, when applied in an undissolved condition, has little fungicidal action. *b.* When applied at the rate of one-half pound in twenty-two gallons of water, two applications reduced injury from fungi about 20 per cent. *c.* The action of the borate of copper upon foliage was caustic when the substance was applied in connection with Paris green, or Paris green and ammonia. Quince foliage, apple, pear, and egg plant suffered least when no ammonia was used. When ammonia was used only the egg plant escaped injury. *d.* The borate of copper possesses no advantages over the carbonate, but its action is similar to it.

*Chloride of Copper.*—*a.* The chloride of copper as a fungicide gave better results than the Bordeaux mixture. When used at the rate of three ounces in twenty-two gallons of water, two applications reduced injury from mildew 35 per cent. *b.* Solutions of copper chloride must be weak. One application, at the rate of one and one-half ounces of the chloride in twenty-two gallons of water, injured the foliage of apple and peach trees. *c.* Paris green increases the caustic action of a solution of the chloride of copper.

*Arsenites.*—*a.* Paris green, when applied in connection with the ammoniacal carbonate of ammonia, does more injury to foliage than would an equal amount of London purple. *b.* London purple, when applied in connection with the carbonate of copper held in suspension in water, does more injury to foliage than would an equal amount of Paris green. *c.* London purple and Paris green increase the caustic action of the ammoniacal carbonate of copper, of the carbonate of copper suspended in water, of the sulphate, hydrate, borate, and chloride of copper, when insecticide and fungicide were applied together. *d.* The injury done to foliage by the combinations is probably due to the arsenite which is dissolved by the ammonia or the fungicide.

*Varieties.*—*a.* Some varieties of certain fruits appear to be more susceptible than others to injury from the combinations. *b.* The foliage of egg plants is the only foliage which was not injured by any of the combinations.

#### NOTES.

Spraying to destroy injurious insects and fungi has now come to be a necessity in fruit growing and vegetable gardening. Much of its

success depends upon the operator, however. The treatment must be timely, thorough, and persistent. Above all things, be ready, and begin to spray the moment the first injury is seen or even before. Study the question during the winter, and buy the materials before spring opens. Always use the finest and most forcible spray which will reach the desired height.

There are two leading insecticides—the arsenites, and kerosene emulsions. The arsenites are Paris green and London purple. One pound to 200 gallons of water is a good proportion for apples, pears, potatoes, etc. One pound of Paris green to 300 or 350 gallons should be used on peaches. Never use London purple alone on peaches. For apple worm, begin to spray just as soon as the last blossoms fall. Kerosene emulsion is the weapon to use against all kinds of plant lice out of doors. A good formula is soft soap one quart, kerosene one pint, hot water two quarts. Churn the materials by pumping back into the pail for several minutes. Dilute two or three times.

There are two leading fungicides—ammoniacal carbonate of copper, and Bordeaux mixture. The former is cheaper, and much more easily made and applied. Bordeaux mixture cannot be thrown onto large trees. To make the former, use three ounces carbonate of copper and one quart 22 degrees ammonia. This stock solution will keep if tightly corked. When used dilute to twenty-five gallons. If 26 degree ammonia can be obtained at your drug store, it is better to use five ounces carbonate, three pints ammonia, and fifty gallons water. This is the best general fungicide. For Bordeaux mixture, use six pounds sulphate copper, four pounds lime, twenty-two gallons water. Carbonate of copper costs from 40 to 50 cents per pound, and sulphate about 6 cents. The only successful combination of insecticides and fungicides yet found is made of the arsenites and Bordeaux mixture. When arsenites and ammoniacal carbonate of copper are combined, the value of each material remains, but the foliage is usually seriously injured.

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## ORCHARD GROWING.

Of all the wide diversity of conditions as to soil, lay of the land, elevation or depression, east, west, north, or south, there seems to be none that is not suitable for the project of putting out orchards within

the bounds of Nebraska with a surety of prompt and ample reward. The fact that Nebraska orchards to-day are equally as productive as those of older states, and perhaps more so, even where they have kept up the planting of new orchards as the old ones fail, is one that is full of significance. The opening up of a new country is always subject to innumerable inconveniences, and foremost among them are such as confront the farmer when he comes to the task of planting an orchard. Nebraska as a state may be said to have pretty well passed through this ordeal; and though she did not come out of it altogether unscathed, yet by virtue of her ready resources and a commendable frugality on the part of the people, it is to be seen that time has deftly placed his finger upon this interest, and that the few scars that remain visible are reminders of what should be done in future by way of improvement.

Among the faults or mistakes of early planters was that of putting out a great many trees of early summer varieties. These trees, many of them, have been of little worth and have served no purpose so well as that of covering a good many square yards of ground. Because it was an apple tree it has perhaps been allowed to stand all these years. Its fruit was not very salable because of its perishable character and because the local demand was not large enough to take it. The trees were not well enough cared for to make fruit fit for shipment, and therefore it was largely without a market and has lain upon the ground beneath the tree to rot and breed insects and disease peculiar to orchards. What should be done where such trees remain in the orchards? It ought to be the plain duty of any man who finds such worthless trees in his orchard, trees that have grown worse and worse through ill-treatment or no treatment, to take them out root and branch, and be done with them, burn them for stovewood, and the tops on the ground for fertilizing and for the destruction of insects. Let no guilty one escape. This is what should have been done, long ago.

A few trees of these early varieties is well enough on the farm, but a few is all-sufficient. Any number above what is required for home consumption is superfluous for the farmer, and by the very fact of one or two bountiful crops at an early stage of the orchard's existence, superinduces carelessness in looking after the individual welfare of the trees. The decadence of many an orchard dates from this very circumstance.



If the early varieties of apples are to be handled beyond what is required for domestic consumption it must be done by orchardists who are willing to keep themselves thoroughly posted as to markets, shipments and manner of handling them. Such men as make it a business to handle fruit, and are familiar with the odds and ends of the business and thus suffer no waste in it, they are the fellows that can safely put their hands to any kind of tree and make it yield a purse of money. But a farmer who has not the time or disposition to keep an eye on these details is better off elsewhere.

In conversation with a farmer a few days since the talk took a turn upon the horticultural phase of farm affairs. We piqued him upon the condition of orchards generally throughout the state as to the care bestowed upon them, sometimes presenting the appearance of a wilderness of weeds, at other times sodded to blue grass, then again made use of for pig pen or cow yard. Sometimes the trees are jammed together as though land were valuable in that immediate vicinity, at other times young trees are seen to be in an unkempt condition as if never having seen the pruning shears, while others are splitting in the crotch from poor selection in the first place and no attention given to keeping the crotch free of decaying leaves and fruit as the tree grows older, and from the ill effects of over loading.

And yet our farmer friend affected not a little surprise that we considered the subject of horticulture as worthy of special study for Nebraska people; or for that matter for any one under any circumstances. That is where most people make a greivous mistake. It is thought that if the home need is supplied that is about all that is worth while to look after. Therefore there is a disposition to set out trees liberally and then to trust to the natural course of things. This of course results in a scrawny lot of fruit for the most part for which there is no market anywhere, whereas if proper and intelligent attention be given the matter, from planting the trees down to the shipment of the fruit, the few acres that are devoted to the cultivation of orchard fruits pay double that of any other equal number of acres on the farm. Now that is putting it easy.

Let us specify a few points: when planting, our advice is always to give plenty of room, though if desirable, put in the rows between the trees that are expected to stand permanently trees of shorter life, trees that come into bearing early and get out of the way by the time the

other trees need the room. If not these trees, then use small fruits. They pay a good profit and can be grown continuously for several years before the crowding season sets in. If not these then put it into corn or potatoes or vegetables of some sort or other. Anything that will give the orchard thorough cultivation and pay a profit. But to the orchard proper. Suppose we grow fifty trees to the acre in place of 150 or more. These trees, well selected for commercial purposes and well cared for, will produce at a very moderate estimate, an average of five bushels per tree for fifteen years following the age of four or five years. This would make an annual yield of 250 bushels per acre. If sold at thirty cents per bushel, which is an extremely low price for such fruit, it would show a \$75 crop to the acre. This is taking no account of the side matter of cultivating other crops on the ground which always well repays the whole trouble and expense of orchard cultivation.

We mention these things to show the possibilities that are open to those who have a mind to do things right and be timely about it. A good article is required to go on the open markets of the world and command a good price. Nebraska soil and climate will produce this article without end if we only have the intelligence to run the machine.

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## THE FARMER'S GARDEN.

EDITOR AMERICAN HOMESTEAD: We write this (March 15) on one of those days which are inclined to be a little discouraging to the early gardener, but from a long experience are pretty sure to come every year. We have had a succession of pleasant, beautiful days. Early garden seeds were planted February 25, potatoes were planted two days later, in due time the peas, lettuce, etc., were showing through the ground. Then the temperature fell to 20 degrees, followed by warm weather again; the peas could be seen clear across the garden. Other seeds were planted together with the main potato crop and early field corn, and plans were laid for commencing the planting of the main field corn to-day, as one stirring neighbor had commenced March 8, but the hard rain of yesterday was followed by sleet and so we got close to the fire. This morning we look out and see everything covered with a half inch icy coat. We will tell you how those

peas weather the storm at some future time. This much we know, that this not unusual weather, though we suppose that many are thinking just now that they never saw such cold weather at gardening time before. Your central readers will be experiencing such seemingly untimely weather in April, and your far north readers will be complaining of just such weather in May, each forgetting that such conditions have often been before. We have kept record for many years, and our seasons do not vary as much as popularly supposed. Members of our own family have been surprised at this cold weather, and yet on the wall hangs our weather and garden register, and it shows that last year we had still colder weather, 9 degrees, and only ninety miles north of this, though after first garden planting there (March 23), the lowest temperature was only 26 degrees. We had a splendid stand of all kinds of seeds from March 23 and 30 planting, except in sweet corn. Even wrinkled peas and beans came up splendidly, though the first half of April was very cold. Field corn planted April 1 did not show a single shoot above ground for eighteen days, and yet the stand was almost perfect. We have had peas four inches high and beans two inches high, completely covered by an Iowa snow, and corn and beans of same size cut down by a last of May Kansas frost; corn coming again all right, but beans needed partial replanting.

We have always practiced early gardening as regards the hardy vegetables, such as spinach, cabbage, onions, lettuce, radish, beets, peas, and potatoes, with the hardy varieties of beans, and some kinds that, like tomatoes, may need box planting. As a rule, in all the west the early garden vegetables are the best, from the fact that the dry weather in July, usually common, cuts short late planted crops, except such as late cabbage, etc., that mature late in the season. We do not, however, give prominence to the hot-bed that some do. We are not, however, writing for the market gardener. Where much attention can be given to it, and a few days as to earliness count much in profits when marketing, of course it is needed. But to the farmer, with his multiplicity of labors and interests, we advise just such early planting as is likely to succeed in the open ground, where the site of the garden is in a naturally warm location and well drained of surface water. We know there are many farms where there is not much choice of location. Perhaps the site must be almost a level one as ours was, and

soil naturally cold. Then very early planting is questionable until the soil can be thoroughly enriched and drained as well as possible, thus making it much warmer. Then in preparing the ground we always harrow our ground and mark out the rows on a warm sunshine day and let the rows remain open for a few hours before planting. This warms the ground and hastens the germination of the seeds.

Allow us to recur again to the form and convenience of the garden. We have tried the old square or nearly square shape and know of its great inconvenience as compared with the long row system. But we know of the sometimes impossibility of changing after the lawn, orchard, and small fruit grounds are located. We passed a rich garden yesterday but we sympathized with the plowman. A furrow only three rods long could be made for there were permanent plants such as rhubarb and asparagus, and small fruits and vines on every side, and of course only on two sides could the team be driven close to them. Now these kind of plants should all have been placed in long rows at one side, where they could be readily cultivated with a horse, and the ends of the vegetable garden left free and open so that plowing and cultivation can be done with the utmost convenience. Then we would plant potatoes, sweet corn, etc., just alongside, the truck patch to merge into the general field. When we learn to discard all but the dividing line fence between the stock department and vegetable and fruit department of the farm, we will have made one long stride towards making the garden what it should be on the farm—one of the most profitable of all its acres. Use the power of the horse, and if you need a large garden, get a good hand cultivator. We use Everitt's Man Weight and can recommend it.

J. M. RICE.

*Burlington, Okla.*

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## POMOLOGY IN THE ELEVENTH CENSUS.

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Excerpts from a paper prepared by Mortimer Whitehead.

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MR. PRESIDENT, AND MEMBERS OF THE AMERICAN POMOLOGICAL SOCIETY: In accordance with the requirements of the constitution of our country, at the end of each decade passed in the flight of time, the machinery is set in motion for an official census or enumeration of the population within the borders of all our land. From time

to time as these ten-year mile stones have been reached, other inquiries and enumerations have been added to the central idea of a count of the people, until the United States census has grown to be an extended and elaborate inquiry into all the industries, commerce, and social relations of our national life.

Agriculture is our greatest, our most important calling. It is the foundation and great moving power of all other industries, trade, and commerce. It feeds and sustains all the rest. About one-half of our population live upon the acres of our great national farm. This farm has its vast fields of hay, cotton, corn, wheat, and other cereals; its great number of horses and mules; its mighty herds of cattle, sheep, and swine, on hillside, prairie, and in valley; its immense dairies turning out millions of pounds of butter and cheese; its crops of sugar, tobacco, hemp, flax, hops, and rice; its poultry and its bees. All these to be counted, numbers, acres, product, and value. And more, the buildings, the fences, the forests, the labor employed, all to be looked after and enumerated in the aggregate of our national wealth. But still other portions of this great farm of ours must be taken into account, and it is that portion so well represented by these, our friends and co-workers here assembled, who, though coming from homes thousands of miles apart, have felt the "touch of nature that makes the whole world kin," representatives of that "higher art of agriculture," first and best, given to man in the earliest paradise, a taste of which comes to us in those beautiful morning hours when amid "bud and bloom, sweet perfume," or, surrounded by the fruits of our labor, we are wont to feel, if we do not always say:

"Oh! Maker of the fruits and flowers,  
We thank Thee for the wise design,  
Whereby these human hands of ours  
In nature's garden work with Thine."

Yes, we must count our wealth in orchard and vineyard, as well as in field, factory, and mine.

In the tenth census, or that of 1880, the agricultural schedule contained but a few inquiries relating to fruit growing, and even then the results obtained pertaining to pomology were never printed.

In preparing the agricultural schedule for the eleventh census the questions relating to pomology were increased to fifty. To the apple and peach were added the apricot, cherry, pear, plum, and prune and

a general inquiry concerning "other orchard fruits." Small fruits were not forgotten, and the blackberry, cranberry, raspberry, strawberry, and a column headed "other small fruits," were given a place. The vineyard questions were increased to seven, and in view of a special investigation, nurseries remained at two.

There were 43,000 enumerators and within the thirty days of June, 1890, in theory at least, every farm in the United States, of three or more acres (and less than three acres if the annual product amounted to over \$500) was visited and, along with all the rest, our questions relating to pomology were asked.

The heaviest work has been completed; the count has been made. All that remains now to be done is the mere routine work of getting the figures into shape and having them published for the general good.

I wish to give one illustration of our efforts to make this pomological inquiry of the greatest practical value. Under the head of the various orchard fruits and the vineyard, in addition to getting the number of "bearing trees" and "vines bearing," we inquired for the number of "young trees not bearing" and "acres in young vines not bearing." When these figures are properly tabulated and printed, at a glance the student, be he home-seeker or man of business, can tell by counties in just which portions of our country any given variety of fruit is successful, and where its cultivation was being extended during the eleventh census year.

It has been the custom for a long time in taking the United States census to make a number of elaborate inquiries and special investigations into some lines of productive industry, commerce, and business.

Agriculture has in the past been favored with a few of these special investigations, but only a few. And so the superintendent was once more appealed to, and the privilege for some special horticultural investigations was most kindly granted, and just three special agents were selected.

The first appointment for special work was that of Col. H. Gardner, of Hammondsport, N. Y., for the viticultural investigation.

Soon after, Mr. J. H. Hale of South Glastonbury, Conn., was called to assist, and the special investigations in nurseries and seed farms, tropic and semi-tropic fruits and nuts, and in those horticultural, if not pomological branches, floriculture and truck farming, were placed under his special care.

Later along in the work, as our plans were developed, Mr. A. N. Brown, of Wyoming, Del., was appointed and given charge of the investigations of our great peach industry, which has become now truly national.

The data asked for on these special topics included everything relating to the cost and methods of production, etc., and were very comprehensive.

As in other parts of the census work, results are obtained, and the facts and figures are published in the form of preliminary bulletins. The census volumes proper come later.

Of the preliminary bulletins, six relating to pomology have already been prepared; three have been published and sent out, viz.: viticulture, floriculture, and truck farming.

Much as we have been wont to magnify our calling, it is only when we commence to touch its figures, rolling up into the millions on all sides, that we realize the importance of our industry, the vast progress it is making, that our country, great in so many things, is greater than all others in its production of fruits. A few only of the interesting and gratifying figures we have obtained can find place here.

It should be remembered that the figures of all census crops are those of 1889, and not those of later years, with more extended areas, or of years when the yield has been greater than in the census year.

From the tabulation of our regular schedules, and those of the special investigation, it appears that there were in the United States in the census year 4,510 nurseries, valued at \$41,978,835.80, and occupying 172,206 acres of land, with an invested capital of \$52,425,669.51, and giving employment to 45,657 men, 2,279 women, 14,200 animals, using in the propagation and cultivation of trees and plants, \$990,606.04 worth of implements. Of the acreage in nurseries, 95,025.42 acres were found to be used in growing trees, plants, shrubs, and vines of all ages; and the figures, based upon the best estimate of the nursery men, make the grand total of plants and trees 3,386,855,778, of which 518,016,612 are fruit trees, 685,603,396 grape vines and small fruits, and the balance nut, deciduous, and evergreen trees, hardy shrubs and roses. The largest acreage is devoted to the production of apple trees, viz., 20,232.75 acres, numbering 240,570,660 young trees, giving an average of 11,890, while the plum, pear and peach, respectively, 7,826.5, 6,854.25, and 3,357 acres, pro-

ducing 88,494,367, 77,223,402, and 49,887,894 young trees, or an average of 11,307, 11,226, and 14,861 trees to the acre.

Far from being the least in importance in the grand feast that Pomona now annually spreads over our great national domain, are the oranges, lemons, figs, pineapples, and nuts. Great strides have within a few years been made in the production of tropic and semi-tropic fruits and nuts in our country, and our special census investigation in this new field has proven to be one of intense interest. Its surprises have been many, but its facts and figures are not yet fully in shape.

Our investigations have brought out most clearly the immense value the Department of Agriculture has already been to our pomology. Our viticulture investigation most clearly shows that in localities, states, and sections where the black rot, mildews, and other fungoid diseases of the grape had of late years been spreading, destroying the crop and discouraging the growers, even in some instances to the abandonment of the business, that the practical application and dissemination of the ways and means for spraying, that, almost as upon the command "about face," the industry has turned from apparent coming destruction to the brighter days of complete success. The same with the introduction of the little *vedalia cardinalis* from Australia into California, which has protected the orange trees from the destructive, cottony scale, and, as I have personally witnessed, has caused large orchards to rise almost phoenix-like from their ashes. And so with diseases of the vine, the peach "yellows" investigation, and others yet in progress.

The project of establishing a permanent census bureau is now being agitated, and Mr. Mortimer, after reviewing the present system of taking the census and the importance of agriculture in the United States, thus expressed himself:

Whatever may be proposed for the collection of the census statistics of other industries, I shall insist now that we have the great industry of agriculture in charge of a department of the government, with its many important and constantly growing divisions, with a large force of experts in their various specialties, that everything pertaining to agriculture, including its census, shall be under the control of the secretary of agriculture. If the regular census of agriculture, including its pomology, is to be published but once in ten years, let the scientific and practical agriculturists, horticulturists, pomologists, florists,



and stockmen, together with their clerical force and other assistants, with their farm and agricultural college training, with their love and enthusiasm in their chosen life-work, have their share of the census appropriation, and let them, with all their experience, their valuable data, always being collected, take, prepare, and turn over to the census bureau the figures for the census of agriculture in all its diversified lines.

In gathering the national statistics of pomology and other branches of horticulture a beginning has been made, a few furrows have been plowed in a new field. We have tried to lay the foundation stones, rough as they may be, broad and deep; other workmen and builders in the future will, I trust, erect the superstructure and give to our industry the statistics that are considered of such great value by those engaged in other callings, enabling them to calculate intelligently on probabilities.

Our work in the interest of pomology in the eleventh census has been one of love and duty. Let us strive to still more advance a calling that, in the words that years ago I heard fall from the lips of our revered Wilder,

Leaves no sting in the heart of memory,  
No stain on the wing of time.

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### STRAWBERRY LEAF BLIGHT.

Prof. H. Garman, entomologist and botanist of the Kentucky Experiment Station, reports in Bulletin 31 of that station a series of experiments in the application of Bordeaux mixture to strawberry plants for the prevention of leaf blight, from which he draws the following conclusions: 1. Injury from strawberry leaf blight can be largely prevented by the use of Bordeaux mixture, or Eau celeste, and to some extent by potassium sulphide and London purple. 2. Bordeaux mixture is much superior to the other preparations named; and (3) applications of it should be made as often as once in two weeks. From the complete exposure of the leaves to rain, the mixture is removed from strawberry leaves much sooner than from grape leaves or those of trees. 4. The formula for Bordeaux mixture: stir together well, bluestone (blue vitriol),  $6\frac{1}{2}$  pounds; lime,  $3\frac{1}{2}$  pounds;

water, 22 gallons. It may be sprayed without injury to leaves. 5. Twenty-two gallons of the mixture is sufficient for spraying during one summer 337½ feet of strawberry plants, as commonly planted in rows, and will cost for materials, considering bluestone worth 8 cents per pound, and lime worth 1 cent per pound, 56 cents. By buying materials in quantity this cost can be reduced. 6. A removal of the blighted leaves in summer, without subsequent spraying, will increase instead of diminishing the injury from blight.

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## HOME GROWN STRAWBERRIES.

### GOOD ONES FOR ALL—▲ SHILLING A BUSHEL.

The above is not a sensational statement by any means, but a fact proved by experience of many, our own included. We have yet to find the person who does not relish *good* strawberries, those picked ripe from home vines, not the green things gathered unripe for distant marketings, picked before their flavor is fully developed, and then injured more or less in the carriage and long standing in the stores before getting to actual consumers.

Strawberries grow in nearly all climes. We never ate more delicious ones than those bought at a railway station on the west bank of Lake Wetter in Sweden, grown on the mountain side in north latitude 60 degrees, corresponding to northern Hudson bay, in British America, or 700 miles further north than the city of Winnipeg. All know that whole freight train loads of strawberries come north early in spring from Florida and the Gulf states, grown in latitude 28 to 32 degrees. This covers a belt of over 30 degrees, or over 2,000 miles. Every kind of soil not natural to strawberries can be easily made so; if too wet and heavy, by a little under or open drainage and ameliorating with plenty of manure or sand; if too sandy, by adding heavy loam or clay and manure. With small outlay for a few dozen plants of desirable kinds to start with, the after care and culture need not amount to over one shilling, on ground enough to produce a full bushel of excellent berries, reckoning time at \$1.25 a day. The picking for home use will be gladly done by the "women folks," and take less of their time than to prepare something else to give variety and pleasure at meal times. Strawberries are healthful as well as de-

licious, and by selecting early and late kinds their season may extend over four to seven weeks. There *should* be a plat large enough for a full family supply on *every* farm and on *every* village lot 50 by 150 or 200 feet in dimensions. Any one neglecting this provision lives far below his natural privileges.

The directions are simple, and are fully given either in this number or from time to time in our garden department. Select the proper location *now*. Let it be put in good condition for corn, but a little richer, with deep plowing or spading and mixing in manure with loam or clay or sand if needed for a good corn crop, and draining if necessary, which may be supplied by an open cutting alongside the "patch." Then get two to six dozen plants, more or less, according to size of household, from the dealers, if not obtainable free from a neighbor. Select from the fruit lists commended for your locality in this and other numbers, two or three of the *best* kinds, one of them a staminate or fertilizing variety. Early, medium, and later kinds are desirable to extend the season. Set out on a damp day or evening, watering and covering *if* needed, and your plat is ready for business. It needs afterwards only an hour or two of time all told, according to size of plat, to hoe out the weeds, mulching with straw or hay in late autumn, and pull it off the plants into the spaces between the rows in spring. That is about the whole of it, and you have a bed that will afford a world of pleasure. We have proved it by actual trial. The only money outlay is for the first starting plants, quite small now, as the grower's catalogues, freely sent for the asking, will show any one. We repeat that the after cost need not exceed one shilling on the ground that will supply a full bushel or more. Better provide while about it, for four bushels, or three or four quarts per day during four to six weeks, if the family is large enough, or friends near to eat so many.—*Orange Judd Farmer, April 2, 1892.*

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## PLUMS.

A plum patch is one of the possibilities and should be one of the necessities for every farm. Where a farmer lives within ten miles of a creek (and where is there a farmer that does not?) his plum patch need not cost him anything but time and labor. The common wild

plums are quite an addition to one's larder and are just the thing to start a patch with. Take a jaunt to the creek this fall and bring back a score or more of young plum trees. The jaunt will do you good if the trees don't. But digging the trees is only one step towards procuring a crop of plums. The setting out and the careful tending for a year or two, is where most men fail. A young plum tree will not thrive in sod any better than will a young apple tree. Do square things here and you will have plums. Plant the trees close, say eight feet each way. They will sprout profusely, which is just what you want, unless you are going into the business of raising plums for the market. Then, of course, you shouldn't bother with wild sorts. But to the farmer who wants plums for his own use, and who doesn't wish to put any care on the trees, the thicket plan is the best. In a few years the sprouts will make trees and completely shade the ground. The weeds will not thrive under the trees, and they afford a fine shade for the chickens in summer, and a fine place for the chickens' dust bath. If you have a horticultural eye you will do some judicious thinning, but the trees will bear lots of plums whether they are thinned or not. Improvement is always in order, and if you are the improving sort, you will purchase a half dozen trees of the Wild Goose and the Miner or some other good varieties, and graft your wild stock from them. In a very short time you will have improved plums by the bushel.

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## HOW TO GROW STRAWBERRIES.

Jas. W. Long, Cook county, (N. E.) Ill.: My soil is a rich black loam, becoming somewhat clayey on the knolls. I grow Crescent for main crops, and like the Longfellow, although old, also Sharpless and Bubach. The latter is a little too soft for market. I grow from 4,000 to 5,000 quarts to the acre of the best sorts. To prepare a bed for berries first spread fifteen loads of well rotted horse manure to the acre and plow seven inches deep; follow with seeder and floater until the ground is in good condition, level and fine. Mark out the rows, being careful to drive straight, so that the after cultivation is made easy. As the weather has twice been too dry to set plants in autumn, I now plant in spring. Dig a hole with a pointed hoe,

have an assistant place a plant nicely in it, and with the back of hoe press the dirt about it, leaving the ground level. When weeds start, cultivate with a one-horse 14-tooth cultivator by going up one side of the row and down the other. One can get very close, thus reducing the amount of hoeing and weeding needed. If young plants are wanted, let runners fill the middle space between rows after August 1. A fine toothed cultivator is a good instrument, does not throw soil, keeps the top fine and trains the runners without breaking them off. I cover the bed with oat straw, or any material free from seeds, as soon as the ground is frozen up, and remove when danger of heaving is past. Cultivate as soon as plants start growing, then replace mulch between rows three or four inches thick, and leave until after fruiting, then remove again and cultivate all summer with a deep stirring cultivator. In the fall, apply rotted manure between the rows, also wood ashes if obtainable, and let remain until the following fruiting time. When the crop is off, plow under and sow turnips, Hungarian, or fodder corn. Give one or two rotations before again setting to berries. Have not found it profitable to let plants remain after second fruiting.

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### THE APPLE CROP OF SOUTHWESTERN IOWA.

J. M. Bechtel, division freight and passenger agent for the Iowa division of the Chicago, Burlington & Quincy railroad, has prepared a statement showing the shipments of apples from points on the Iowa division from July 1 to December 31, of last year, and has sent out such statement to the newspapers. The total number of barrels of apples shipped is 249,759, which lacks only 241 of a quarter of a million. Counting 150 barrels to the car load there were 1,665 cars of apples shipped from points on the Iowa division in the last six months of last year. This is equal to about eighty train loads. The bulk of these shipments were from southwestern Iowa.

The Iowa division of the Chicago, Burlington & Quincy includes the main line and all the branches, but does not include the leased lines, such as the Humeston & Shenandoah, or Kansas City, St. Joe & Council Bluffs. Included in the showing are a half dozen Missouri points that are southwestern localities in all but name.

Hamburg, which shipped 34,615 barrels, leads the procession; Glenwood, with 26,093 barrels, coming next, and Clarinda third, with 10,911 barrels. Following are the shipments from southwestern Iowa by counties: Montgomery, 17,384; Fremont, 43,144; Mills, 41,309; Page, 26,115; Taylor, 9,927; Adams, 14,574; Clarke, 7,143; Decatur, 1,574; Union, 1,429; Ringgold, 1,789. Pottawattamie is a great county for apples, but most of the apple crop there is hauled to Council Bluffs and Omaha by wagon. The shipments from Council Bluffs are not given in Mr. Bechtel's statement sheet. The following shows shipments from towns in this corner of the country not included in the foregoing:

	BARRELS.
Bethany, Mo.....	4,492
Blythedale, Mo.....	598
Bridgewater.....	7
Burlington Junction, Mo.....	3,992
Carson.....	66
Clermont, Mo.....	2,230
Cumberland.....	1,365
Darlington, Mo.....	1,902
Fontanelle.....	24
Grant City, Mo.....	9,029
Greenfield .....	18
Griswold.....	1,398
Helena, Mo.....	542
Hopkins, Mo.....	8,187
Macedonia.....	2,366
New Hampton, Mo.....	872
Orient .....	207
Bridgeway, Mo.....	1,135
Union, Mo.....	4,499

Including all the above towns as practically southwestern Iowa towns, about eighty per cent of the total shipments of nearly a quarter of a million barrels were from southwestern Iowa. It should be remembered also that the Wabash, the Rock Island, the Kansas City, St. Joe & Council Bluffs, the Chicago, Milwaukee & St. Paul, the Northwestern, and the Diagonal and other railroads took a good many shipments of apples from southwestern Iowa.

### TOP-WORKING APPLE TREES.

Edson Gaylord, Floyd county, (N. C.) Iowa: I recently received a letter from a farmer orchardist saying he had during many years been trying numerous varieties, but all had proved failures except the Duchess. I wrote suggesting that he procure extremely hardy kinds and top-work them with better varieties. He replied that he had always bought the very best varieties recommended, and could not see where the improvement would come in by top-working, or by "grafting, as he supposed I meant." Nine out of ten farm orchardists take the same view. But long years of experience and observation indicate to me that very few men put in practice any suggested plan until they "catch on" to some of the reasons which meet at once their partial approval at least.

Two items are very important: First, hardiness of tree; second, quality of fruit. If we would be fortunate enough to find both hardiness and quality combined, then we would not be at the imperative necessity of resorting to top-working. But it is too true that such quality of fruit and hardiness of tree are seldom combined. The hardiest trees in top, trunk, and root produce our inferior fruits, while the varieties which produce our choice apples almost if not invariably fail in their forks and trunks, mainly in the former, while few fail in their tops, even among our choice kinds. The justly famed Wealthy seldom fails in its top but almost always in its forks and trunks. Then we have the Transcendent, Hibernial, Virginia (crab), and Duchess and others which seldom fail in the trunk when properly grown. On such put the many varieties which we term three-fourths hardy, such as Wealthy, Plumb's Cider, Fall Orange, Fameuse, Utter's Red, and numerous other old varieties, many of which have been proved a success in northern Iowa. By taking two varieties and securing the hardy root, hardy trunk, and hardy top, we have at once secured what we have been years seeking for.

Another very important reason for top-working is that nearly every home has more or less hardy trees which are now worthless or nearly so, which if properly top-worked with judicious selections might be made objects of pleasure and delight to the family circle. The greatest difficulty just now in the way of top-working is to know the profit-

able results from the union of such varieties as we desire to propagate or work together. While in many cases we have learned results from practical demonstration, yet there are many other cases in which we entirely unable to predict results. The Baltimore on our wild crab has proved a success when favorably located. The same with our Ben Davis and Wealthy on the Duchess; the Jonathan and Baltimore on the Minnesota; the Antonovka (Russian) or Transcendent (crab). The Minkler and the Willow Twig have also done finely in this locality, where they have been top-worked as above suggested. For the northwest, none except the Duchess, Transcendent, and Antonovka have been or are likely to prove a success, unless they are properly top-worked. Plumb's Cider and Wolf River twelve years top-worked on Duchess have never produced an apple in my experience. If any one has succeeded in getting the Wolf River to bear well on any stock in northern Iowa or Minnesota they would confer a great favor on the public by publishing on what they set it to insure success. With us, on its own body or top-worked on the Duchess for the past twelve years, it has proved an entire failure. The (Russian) Antonovka topped on Transcendent has proved a success here. It bears heavily every year. The apples are large, showy and good through October only. How my Russian friends make this a winter apple is a mystery to me. But the fruit, though coarse, is a fine apple for October. We find it a much more desirable dessert apple than the Duchess, and being nearly as hardy in tree it should be top-worked on Transcendent or other hardy stock throughout the northwest.

Our Sweet Malinda has been thoroughly tested on Transcendent in Minnesota, and has proved a grand success there. I shall try this on the Minnesota here, hoping for good results. By top-working the Malinda on hardy trees from five to fifteen years old, I am confident of securing apples from three to five years sooner than by waiting for the trees that are now in nursery rows ready to set. If you have a few hardy stock trees, top-work them soon with scions from old bearing trees of the Malinda, and if your work is properly done, you will prize it above all other apples we have attempted to grow here in the northwest.



## THINNING FRUIT.

Experiments in matters of fruit growing have assumed so wide a scope and are becoming so successful under the intelligent treatment of late years, that the practical farm orchardist on a small scale begins to find it convenient to use a surer means of calling to mind all the various details of orchard work than simply counting them off on his fingers' ends before the kitchen fire on a cold winter's night, and then forgetting them all when the proper time comes for action. If not forgotten they are perhaps shoved aside for what is considered a more necessary piece of work. The only way to avoid this is to have one's work well outlined even in detail, and then live up to it to the last scratch if possible. Of course the weather and other circumstances continually vary the program, but these things are always to be considered in any general outline of farm labor. The first is to always keep the work well in hand and there will be found time to attend to any extras as they gradually come into use and favor under new and advanced methods.

The practice of thinning the fruit from apple trees has been followed to some extent with great success and is no doubt in time to come into universal use by apple growers, as its reasonableness and good effects have a chance to show themselves. There is a large proportion of our apples thrown aside as worthless or go at a price that does not pay for handling. These are the small apples that result from overloading the tree. It is also said by orchardists that the same practice of permitting the orchard to go as it pleases in the matter of bearing is altogether against the certain formation of fruit buds. Therefore a tree that is allowed to carry an overload of apples one year is not nearly so apt to have a reasonable number of strong and vigorous fruit buds the following year as is the tree that is deprived of any excess as to quantity the year before.

## ORCHARD AND SMALL FRUITS.

## APPLES TO PLANT—SMALL FRUIT VARIETIES.

J. W. Christ, Lancaster county, (E. C.) Neb.: Our soil is a dark sandy loam, and the prevailing winds in summer are from the south and in winter from the north. I raised potatoes and "truck" on the land during the first two seasons after breaking the prairie sod. I plowed it seven or eight inches deep and pulverized it well. The first of the next May I laid the land off in rows twenty feet apart, by turning dead furrows where the tree rows were to be. From the bottom of the dead furrows I dug one spade deep and set the trees twenty feet apart in the rows. Then I worked the dead furrows shut and leaned each tree sharply to the southwest.

For summer apples, I chose Duchess of Oldenburg, Cooper's Early White, Early Harvest, Red Astrachan, and Red June. For autumn, Fameuse, Fall Wine, and Maiden Blush. For winter, Ben Davis, Jonathan, Geniten, Winesap, Dominie, Golden Russet, Willow Twig Stark, Milam, Missouri Pippin, Mann, and Yellow Bellefleur. The peaches I planted were mostly seedlings, but I had a few Amsden, Alexander, Beatrice, Crawford's Late, and Smock. Only native varieties of plums were set. Of pears I had Sheldon, Bartlett, and Flemish Beauty. I set the apple trees 20x20 feet, peaches and pears 16x16 feet, and plums in a thicket 3x4 feet apart. The first year I planted the orchard to potatoes and gave clean culture. Three per cent of the trees died. The second, third, and fourth year, corn was planted, and the stalks were left standing over winter to assist in protecting the trees. Grafted the trees at different times from the last of April to June. Had the best success in June. I used cleft grafting. In early spring, each year, I pruned, training the tops low and thinned out the branches, to let in the sun. I planted the trees too close and made some bad selections of varieties, and got too many winter kinds. I have learned to take the advice of the oldest and most experienced fruit growers in my immediate locality; to purchase stock only from the most reliable nurserymen in one's own state or section, and to avoid the tree peddler, and new varieties or novelties.

## PRESENT BEST VARIETIES.

For summer apples I would now plant in this locality Duchess, Red June, Cooper, E. White; for autumn, Maiden Blush, Fameuse, Wealthy, Utter's Red; for winter, Winesap, Ben Davis, Geniten, Missouri Pippin, Jonathan, Grimes Golden, White Winter Pearmain, Pennsylvania or Otoe Redstreak and Gano in or about the order named. Too much care cannot be taken to avoid undue exposure of the trunks of apple trees to the sun. The same is true of the cherry. The prevailing south winds will incline some trees to the north and such should be protected by wrapping. Such varieties as Willow Twig, Golden Russet, Dominie, Red Astrachan, and Yellow Bellefleur have proved utterly worthless here; they either blight to death or are so unproductive as not to deserve planting. Two rods apart is close enough for the apple. It should be cropped in corn, potatoes, or other cultivated plants for about six years or until the trees begin bearing. Use stable manure in the meantime, after which seed to clover and pasture with hogs.

## SMALL FRUITS.

I have planted strawberries, raspberries, blackberries, and grapes on ground which had been kept in clean cultivation for several years. The strawberries I planted in four foot rows, two feet apart in the row; grapes eight by six feet; raspberries, eight by four feet; blackberries, ten by four feet. The varieties of strawberries planted were. Wilson, Crescent, and Parker Earle. Raspberry varieties planted, Mammoth Cluster, Gregg, and Turner; blackberries, Snyder; grapes, Concord, Worden, and Pocklington. I use posts and wire trellises, but made the mistake of planting too many willows, etc., in close proximity for "protection." Currants and gooseberries do not do well here, the latter nothing at all. I cultivate the Early Richmond and English Morello cherries, both of which are hardy and productive.

## HOW TO SET TREES.

MARK LAND WITH SULKY PLOW—GOOD ASSORTMENT, OF APPLES—  
CATALPA FOR TIMBER.

T. M. Alexander, Coffey county, (E. C.) Kan.: My land is upland limestone soil. I plow the ground intended for trees about eight inches deep. For an apple orchard, I mark off the land in checks thirty feet each way, with a sulky plow set to run a little deeper than the ground was plowed, so that it will scour. I prefer the sulky plow, because I can make better and straighter furrows. Set a tree at each check. This manner of laying off the land greatly facilitates planting, as the planter has very little dirt to move before setting his tree. As soon as the trees are home from the nursery (always buy trees of your home nursery), heel them in. When planting do not take more than half a dozen trees out at a time. Trim off with a sharp knife the ends of all broken roots. Set the tree slanting toward the one o'clock sun. There are two reasons for this: first, the foliage of the tree protects the body during the hottest part of the day, and second, the wind will have the tree straightened up by the time it has attained its growth. The body of the tree must be protected from the sun's rays. With the tree in this position and roots spread out nicely, fill in and firm the dirt around it with the feet. The tree should be set about two inches deeper than it was in the nursery. I cultivate the ground in some hoed crop for at least three years after setting the trees; then sow to clover. I formerly mulched the trees, but have abandoned that, and now use the hoe around the trees with better success. In an orchard of 150 trees I would set 50 Ben Davis, 50 Wine-sap, 20 Missouri Pippin, 5 Jonathan, 5 Rome Beauty, 5 Fall Rambo, 5 Maiden Blush, 5 Lowell, 3 Red June, 2 Sweet June. I have several thousand forest trees growing. I set them six feet apart each way; I have all the native varieties, and hardy catalpa, which I prefer on account of quick growth, and the excellent quality of the timber. The trees must be kept trimmed up until they begin to crowd each other, or they will spread out like a sumach. I have planted all kinds of trees, both in the spring and fall, but greatly prefer spring planting, for everything but cherries, which must be planted in the fall.

## BUDDING ORCHARD TREES.

### HOW TO BUD—SETTING TREES.

J. M. Maxwell, Waukesha county, (S. E.) Wisconsin: When the stocks to be budded are set out in the spring, cut the root back to within four inches of the collar, set six inches deep, and four to six inches apart in the row. When it is time to bud, remove enough earth to enable you to set the bud in the collar. In autumn dig the stocks and put them in the cellar or heel in out doors. When you set them out the next spring set them in a trench seven inches deep, fill in the trench up to the bud and after the bud has well started fill the trench in level. When you give them the last cultivation, early in August, throw two or three inches more of earth up to the trees. This will give four or five inches of earth over the place where the bud was set, to protect the root through the cold winters, and the tree will be on its own roots in time. In setting an orchard, get your trees and advice as to varieties as near home as possible (Talman Sweet, Oldenburg, and Fameuse do best here). Cut off the ends of all bruised roots, prune the top to a central trunk, with side branches alternate on sides, not closer to one another than six or eight inches; lean the tree to the southwest (it will be straight enough by the time it bears), protect the trunk by winding with straw or Phillips' lath and wire shade. The latter is the cheapest and best of all, as it does not need renewing until the tree is able to take care of itself. Do not plant closer than twenty feet each way; but plant deeper than the tree stood in the nursery, especially if you want budded trees, which I would advise you to. Plant the orchard in root crops and keep well cultivated until it gets to bearing age, and never let it get into stiff sod, or your apples will be few and poor in quality. Do not be afraid of manuring the orchard after the trees get to bearing well. Ashes are very good mixed with cow manure. Do not let the plow, whiffle-tree, and cattle do any of the pruning, but do it yourself with a sharp knife, just before the sap starts in the spring. Take off most wood on the north side, and wax or paint the wounds. If every farmer would plant six hardy apple trees every spring and take a little care of them, Wisconsin would have apples to sell. One good apple tree in full bearing is worth \$25.

## APPLES FOR KANSAS.

## BEST VARIETIES—BORERS—SETTING—DISTANCE.

Samuel Reynolds, Douglas county, (E. C.) Kansas: My first orchard of five acres was planted in Kansas, near Lawrence, in 1858. As we had no destructive insect enemies to prey upon our young trees then, all lived and grew vigorously. The varieties were Baldwin, Yellow Bellefleur, Northern Spy, Dominie, Winesap, Ben Davis, Willow Twig, Limbertwig, Ortley, and others. Of these the only ones which have proved profitable are Ben Davis, Winesap, Dominie, and Willow Twig. I have planted year after year until now I have about thirty acres in apple orchard. The varieties which do best in eastern Kansas are Early Harvest, Maiden Blush, Jonathan, Dominie, Ben Davis, Smith's Cider, Missouri Pippin, Winesap, and Willow Twig. These are the most productive, the most marketable and the most profitable varieties for our locality.

We now have to protect our trees against round-head and flat-head borers. The former lays its eggs at or near the crown of the tree, and the young insect lives and works in the tree, if undisturbed, three years, and then emerges a striped beetle to lay its eggs and die. In the three years it completely girdles and kills the tree. It can be detected by the little chips it throws out when at work, and can be dug out with a sharp pointed knife, thus saving the life of the tree. The flat-head borer works higher up in the trunks and branches, and can be detected by the darker color of the bark. If these insects are kept out of the trees, and they are properly planted, the trunks shaded from the hot sun until they become well established, every tree may be made to grow and prosper.

The record shows, however, that about half our young trees die from sheer neglect. Great care must be taken in planting. Every precaution should be taken to give the young tree the least possible damage from removal from the nursery row. The roots and rootlets should not become dry in the least from exposure to the air in between taking up and replanting. This can best be prevented by getting the stock direct from the nursery, and keeping the roots covered with something damp until the orchard row is ready for them. Then plant them

carefully a little deeper than they stood in the nursery. Spread the roots out their full length, and sift fine soil around and among them. Round up the ground a little about the trees a little above the level, and pack the soil firmly around the trunk. If convenient, place a mulch of long manure around the tree to prevent the growth of weeds and to keep the young roots damp. If the mulching cannot be had, then the hoe must be used freely and frequently throughout the growing season to kill weeds and keep the soil well stirred. The eastern method of severe pruning will not answer for Kansas and the far west. The major part of the pruning should be done when the tree is planted and during the first year or so of its growth. Remove extra branches, and do not leave any directly opposite. Such pruning prevents the formation of crotches, which cause many trees to break to pieces and be ruined. The first orchards of Kansas were planted with trees twenty feet apart each way. As the trees came into bearing the limbs interlocked and it was impossible to drive between the rows with a team, and the fruit was small, inferior, and much of it unmarketable. The distance between the trees now recommended is two rods, and many say forty feet. When set at this distance the trees grow more spreading, the fruit is larger and much more easily gathered. The advantage to the farmer of a good orchard, supplemented with a full supply of small fruits, from the strawberry, blackberry, etc., can scarcely be overestimated. He can have his table supplied with luscious fruits, the entire year round. A good orchard of, say, twenty acres will, as a rule, return as much clear cash as will eighty acres of grain.

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### ILLINOIS TREES AND FRUITS.

Samuel Edwards, Peoria county, (C.) Ill.: Seed of black locust and apple were planted by me at La Moille, in 1842. Of locust I planted some ten acres at different times. The prairie chickens destroyed our largest planting. They ate them soon after they came up; and when the balance were of suitable size for fence posts, borers killed them. Of my early planting, black walnut proved one of the most valuable varieties. White pine, called a slow grower, has made for me a growth of four feet seven inches in a year. *Catalpa speciosa* for fence posts, railway ties, and similar uses, has no superior. White willow

European larch, ash, and elm of several varieties, cottonwood, linden, and several varieties of silver maple, have proved desirable, and each has special uses to which it is adapted. Silver maple is a very rapid grower, and might be valuable on sand dunes where few other crops succeed. There its persistent suckers would not be objectionable. American chestnut is desirable on soils adapted to its growth. With hard-pan soil near the surface it winter-kills. Butternut, Lombardy poplars, and Balm of Gilead are not desirable.

For screens or wind-breaks to shelter buildings, stock-yards, gardens, and orchards, hardy evergreens or white willow should be planted on every farm in the northwest not now sheltered. The time is coming when no prairie home in the north will be considered finished without them. The home nurseryman can advise you much better what to plant and how to do it than any one else. For nearly all parts of northern Illinois, Baldwin, Rhode Island Greenings, Ben Davis, Yellow Bellefleur, and Winesap should *not* be selected as most desirable orchard trees. Rambo, with all its good qualities, is tender in tree. Dyer, Duchess, Yellow Transparent, Bailey Sweet, Snow, Wealthy, Roman Stem, Salome, Sweet Pear, Sweet Vandevere, Willow Twig, and others have proved valuable. Pears on loess soil succeed better than on bleak prairie, where they generally blight soon after beginning to bear. Standards are preferable to dwarfs. Cultivate early in the season, then mulch. They are less liable to blight where grown in grass land. Early Richmond, English and Plumstone Morello, Louis Philippe, Belle D'Choicy, and Montmorency are profitable cherries; as are Miner, Wild Goose, De Soto, Forest Garden, Golden Beauty, and other choice native plums. Several varieties planted near together aid fertilization. Of grapes, Worden, Moore's Early, Concord, Clinton, Ives, Lady, Martha, Pocklington, and several of Rogers' Hybrids are satisfactory, and, in some localities, Catawba, Delaware, and Diana are valuable. Cuthbert, Shaffer's Colossal, and Turner are good red raspberries. Black Caps have so much disease of plants, I do not plant them. Snyder for early and Stone's Hardy for late, are the best of fifteen varieties of blackberries tested by me. Victoria, Red Dutch and White Grape currants, grown in the shade with liberal mulchings and manurings, are best here. Downing is the best gooseberry here, but a few Houghtons or Am. Seedlings, may be set out. Bubach No. 5, with any good fertilizer intermixed, is my choice for strawberries. It



s best to learn what varieties are best in your own vicinity, and plant them. Keep free from high-priced marvels from distant places. Plant what fruits you can give good care, and no more. The "lazy man's" variety has not yet been discovered.

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## SHELTER BELTS AND ORCHARDS.

A. A. Berry, (S. W.) Iowa: Located in the famous blue grass region of southwestern Iowa, where the soil is a rich black loam, the necessity of planting trees for protection is apparent. Evergreens are superior to deciduous trees for protection, and the varieties best adapted to this soil and climate are the Norway spruce, white spruce, white pine, red cedar, Scotch pine, and arbor vitæ. Trees twice transplanted and from eighteen to twenty-four inches high are the best to plant out. Plant on the north and west of your buildings with a row or two at the east. Prepare the ground by fall plowing. Plant April 20 to May 20, according to the season. For inside rows plant arbor vitæ, eight feet apart. For groves, plant three or four rows of Norway spruce and white pine, sixteen feet apart each way, planting these alternately. In planting, keep the roots from sun and wind. Throw a quart or so of water in the hole before placing the tree in, and when set, water well and mulch with straw or sawdust. Never mulch with manure.

During a dry spell water twice a week and you will be repaid by live trees, which will be useful as well as ornamental, and increase the value of your farm. The main thing in evergreen growing is: First, select good trees; second, protect the roots from the sun and wind when transplanting; third, plant carefully, mulch well, and keep the ground moist, if necessary, by artificial means. For a commercial orchard, plant ninety Ben Davis to ten of Jonathan. The Ben Davis is as hardy an apple as one can plant, and the best seller, Jonathan excepted. There is no apple which will yield as well as the Ben Davis; and in spite of the fact that it is a poor eating apple and not popular at home, it is the apple to raise to sell. For a family orchard of 100 trees the following varieties are good: summer—Early Harvest, Red Astrachan, Red June, Summer Queen, and Western Beauty; autumn—Snow, Strawberry, Maiden's Blush, Duchess, and Haas;

winter—Bailey Sweet, Jonathan, Northern Spy, Talman Sweet, Mann, Wealthy, Baldwin, Waldbridge and Rawles' Genet. This gives a good variety of the best apples for this climate. Prepare the ground by deep plowing. Set trees twenty-eight feet apart each way. Make the bottom of the hole round. Work the soil well under the roots with the hands and pack the earth firm. Mulch well the first year or two, and protect from the mice and rabbits with screen wire.

## NEBRASKA ORCHARDING.

### WIND-BREAK NECESSARY—FALL PLOW GROUND—MULCHING— BEST VARIETIES.

D. W. Garver, Clay county, (S. C.) Neb.: Last year I had over 300 bushels of apples, from about 100 trees, some trees having upwards of twenty-five bushels each. The soil here is a deep loam, somewhat sandy, and quite loose after being cultivated a few seasons. The land on which I have planted my orchard has a gentle slope to the south, so that it drains quite well. A northern slope would be better. Fruit trees are apt to be too forward in coming into bloom in the spring here, and are liable to be injured by late frosts. An orchard here must have a good wind-break around it. I planted one row of box-elder trees around mine. I set them about three feet apart and have never trimmed them. They make a splendid protection for the orchard. My orchard ground has been planted to wheat and corn three years. I plowed the ground for the fruit trees in the fall, in lands twenty-five feet wide, so that a row of trees could be set in each dead furrow. I dug the holes for the trees in the furrow, which was about one foot deep. These holes I made about fifteen inches deeper. I received the trees from the nursery in the spring, and planted them immediately and kept the roots well protected from the sun and air until I had them planted. I always make the holes large enough to allow the roots to be straightened clear out. Set the tree in the hole with most of the limbs on the southwest. The limbs and shade will prevent the hot sun from injuring the trunk of the tree. After having covered the roots with dirt, I pour in water enough to make the ground quite sticky; then fill holes up a little above the level of the bottom of the furrow in which trees are planted. I cultivate the or-

chard until the trees commence to bear. I plant in corn or potatoes but never sow small grains. Corn and potatoes keep the trees cultivated. I always hoe the trees several times during the season, as long as I cultivate the ground. I fill up the furrows as I cultivate. I have never stopped mulching the trees from the first planting. I haul in manure every year during winter and mulch the entire surface but thickest close to the trunks of the trees. This prevents sod growing there. I keep the tree tops down close to the ground. Many of the limbs when full of apples rest on the ground partly. The object of this is to protect the trunks from sun-scald, and limbs from being torn off by high winds. I commence right away when planting the tree to form the top. Never cut off large limbs if it can be avoided. I trim my orchard every year in January or February and take off water sprouts, etc. I do not put any stakes or supports to my trees when planting. I protect my trees from mice and rabbits by rubbing on a mixture of lard and coal oil as high up the trunk as the rabbits can reach. I do this in autumn, and I never had them touch a tree protected in this way. If the weather is very dry the first season trees are planted, it will be necessary to water them a few times. I would recommend Duchess, Early Harvest, and Red Astrachan, for early; Snow and Wealthy, for summer; Jonathan, Baldwin, and Ben Davis, for winter. This being rather a dry climate trees grow slowly, but the fruit is excellent in quality and fine in appearance, and an orchard will pay well for all the expense and pains. Many orchard trees have been killed by a disease which attacks the tops and kills the limbs first. Pear trees are most frequently affected, and it is much worse on some varieties than others. Some nurserymen claim that the way trees are grafted causes it. I seeded my orchard down to clover and blue grass when trees commenced to bear, and have not cultivated it since.

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## TIMBER CLAIM PLANTING.

### PREPARING GROUND—AFTER CULTURE.

J. M. Bartlett, Custer county, (C.) Neb.: Eight years ago I began the preparation of ten acres for forest trees under the rules of the General Land Office for timber culture entries. The plat chosen covered two hill-sides and a ravine which lay between them. The soil is

a black loam with clay subsoil. I set ash, box-elder, willow, soft maple, cottonwood, Russian mulberry, black locust, walnut, and Lombardy poplar. The only cultivation the first year was the breaking. The second year I plowed and harrowed it, and the third year I plowed, harrowed, marked out for trees, and after they set cultivated them. The trees were planted four feet apart each way, at about the depth they stood in nursery. Slips, or cuttings of poplar, cottonwood and willow were used; the other varieties had roots, except that nuts of walnuts were planted.

#### CULTIVATION.

The culture the first year after setting included the use of the corn cultivator and the hoe. The next year less hoeing was needed. Afterwards the cultivator only was used until the height of the trees necessitated the use of a one-horse plow. The latter was used until the tree limbs prevented. The scythe was then used wherever the shade was not dense enough to prevent the growth of weeds. My first mistake was planting cuttings. A large number died, and they required several hoeings before they were large enough to plow. Besides the varieties grown from cuttings are not as valuable for timber as some others. The soft maple and catalpa do not thrive in our climate. Russian mulberries closely planted are useful to stop the drifting snow, but are not desirable otherwise, unless it be for the berries. Were I to plant another grove, I would take trees from the nursery not less than ten inches high. One-half of them would be ash, the other half mainly box-elder and walnut. I would plant the walnuts in the fall following the planting of the other varieties. They should be planted among the trees so as to be partly shaded. Thus planted they are hardy and make vigorous growth. Planting should be done early in the spring if the ground is moist. Careful hands only should be employed, or much replanting may otherwise have to be done.



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